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ABSTRACT

The Nebraska Occupational Information books (volumes I and II) contain information about 386 different occupations in the state and answer questions about specific occupations in detail. The descriptions are arranged according to a U.S. Department of Labor classification system, with occupational titles clustered in general groups of selected categories from the Standard Occupational Classification manual. The information provided about each occupation is divided into four sections as follows: (1) description of the occupation, including Holland code, specialties, code number from the Dictionary of Occupational Titles, related occupations, work activities, aptitudes, work setting, Nebraska employment, wages, and growth expected; (2) high school and postsecondary preparation and skills; (3) bibliography; and (4) list of Nebraska postsecondary schools that offer education/training in the field. The following occupational categories are included in Volume I: administration; management occupations; engineers, surveyors, and architects; computer, mathematical, and operations research occupations; natural scientists; social scientists and urban planners; social, recreation, and religious workers; lawyers and judges; postsecondary institution teachers; teachers; vocational and educational counselors; librarians, archivists, and curators; physicians and dentists; veterinarians; diagnosing and treating practitioners; registered nurses; pharmacists, dietitians, therapists, and physician assistants; writers, artists, and performers; editors, reporters, public relations specialists, and radio and television announcers; athletes and related workers; health technologists and technicians; engineering and related technologists and technicians; science technologists and technicians; and technicians. Wage tables and an index are included. (KC)

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421 Nebraska Hall University of Nebraska-Lincoln
Lincoln, NE 68588-0552 Telephone 402-472-2570

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HOW TO USE THIS BOOK

The OCCUPATIONAL INFORMATION books will help find specific information about the occupations that are described in the Nebraska Career Information System. The occupational descriptions in these books match those occupational titles that appear on the "QUEST List" or "SKILLS List" obtained during a sort. The OCCUPATIONAL INFORMATION makes up one of several parts of the Nebraska Career Information System.

What Can the Occupational Information Tell?

The Occupational Information (Volumes I and II) books contain information about 386 different occupations. The books give information about the many careers available in Nebraska and will answer questions about specific occupations in detail.

These books will not tell a person what occupation to enter. Instead, they will provide information, ideas, and resources that will help make decisions about career possibilities.

How is the Occupational Information Organized?

These books contain detailed descriptions of 386 specific occupational titles which are arranged according to a U.S. Department of Labor classification system. The occupational titles are clustered in general groups of selected categories from the STANDARD OCCUPATIONAL CLASSIFICATION (SOC) manual which classifies occupations having similar work activities and which require similar abilities together in a category.

The NCIS occupational titles are clustered into 313 S.O.C. categories and are identified by a four-digit number. Some occupational titles are further divided into specialities which are identified by a five-digit number. The occupations are organized in numerical order by S.O.C. category codes.

What Can Be Found in Occupational Information?

The information about each occupation is divided into four sections: Description, Preparation, and Bibliography and Schools.

Description

The description begins with a paragraph defining the occupation.

Holland Codes place related occupations together which have similar personality types.

Specialties list specific occupations for each general occupation or S.O.C. category and includes the nine-digit **DICTIONARY OF OCCUPATIONAL TITLES (D.O.T.)** number in parentheses.

NCIS Related Occupations lists other occupations that have similar work activities, aptitudes, and/or training. The occupation is preceded by a four- or five-digit NCIS number..

Work Activities describe the activities that take place on the job.

Aptitudes describe the abilities needed by a worker in this occupation.

Work Setting describes the environment, hours, and type of employers who hire people with this job title.

Considerations present factors to take into account when considering this occupation.

Nebraska Employment is projected for each occupation. These approximate numbers are projected from statistics available from the Nebraska Department of Labor and other state agencies.

Wages list salaries for beginning workers in an occupation for Nebraska and across the United States.

Employment Growth shows projected job growth in three ranges. The EMPLOYMENT GROWTH is based on the Nebraska Department of Labor's projection for 1991. The Department of Labor determines the average growth for all occupations in Nebraska during 1986-1991. This average growth rage is 7.06%. Any growth in an occupations below 7.06% is classified as a low growth rate, occupations between 7.06%

and 10.0% growth rate is classified as a medium growth rate, and occupations above 10.01% growth rate is classified as a high growth rate.

For the Occupational Descriptions in this publication the following scale will represent the growth rate of the occupations:

Low Growth (below 7.06%) will be termed Unfavorable Growth
Medium Growth (7.06% - 10.0%) will be termed Somewhat Favorable Growth
High Growth (10.01% and over) will be termed Favorable Growth

See the Department of Labor publication "Nebraska Occupational Characteristics" for further description of the scale.

Preparation

Skills describe the knowledge or skills necessary for a worker in this occupation.

Licensing or Certification describes the requirements necessary to obtain a license or to gain professional recognition through certification.

Training presents the various training paths a person can pursue to gain the necessary skills for an occupation.

Educational Program lists titles and numbers of programs that are in the NCIS Programs of Study and Training Information book that provides additional educational and training information.

Helpful High School Subjects list the high school program or specific subjects that can help in the preparation for this occupation.

Bibliography

Bibliography lists the publications which were used in preparing information about the occupation and which can be used to locate further information about each occupation.

Schools

Schools list postsecondary schools that offer one or more of the educational programs of training.

How Was the Occupational Information Written?

Many different sources of information were used to compile the Occupational Information. Two of the most important sources were the Dictionary of Occupational Titles (D.O.T.) and the Standard Occupational Classification manual (S.O.C.). The D.O.T. and S.O.C. contain more than 12,000 descriptions of occupations in the United States and how these occupations are clustered by worker functions.

Other sources used to expand the occupational descriptions were the Occupational Outlook Handbook (O.O.H.) the Handbook for Analyzing Jobs, the Classification of Instructional Programs, the Classification of Jobs According to Worker Trait Group, and the Health Career Guidebook---all published by the U.S. Department of Labor. The Encyclopedia of Careers and other publications about careers were used in compiling the occupational descriptions. Information on skills was compiled from any of the above resources plus the Dictionary of Holland's Occupational Codes. School and public libraries and school counseling departments and private counseling agencies will have copies of most of the above and other career resources.

Studies, reports, and surveys about employment and wages published by several state agencies and business organizations were another set of career publications consulted by NCIS in writing the occupational information. Career briefs published by various organizations were additional sources of information.

The NCIS staff is in continued contact with people in the field to review the occupational descriptions for accuracy. These people are educators, supervisors, or employees in the occupational area. The reviewers answer a questionnaire about the information and suggest changes and additions which improve the content of the occupational information.

HOW TO FIND OCCUPATIONAL INFORMATION OF INTEREST!

Begin an exploration of occupations by completing the QUEST Questionnaire or the SKILLS Inventory to produce a list of NCIS occupational titles related to interest and abilities or skills.

Occupations of interest can also be found by using the alphabetical INDEX of OCCUPATIONS in the back of each volume. Locate the four or five digit number and turn to that occupation. The Index also contains the alphabetical list of **occupational specialties** titles.

After reviewing the "List" of occupations from the QUEST questionnaire, the SKILLS Inventory, or the alphabetical list of occupations to select some specific NCIS job titles, locate the occupational information by using the numbers appearing next to the titles and locating those numbers in either Volume I or II.

Another way to find information about an occupational titles is to use the "Table of Contents" that lists all 386 occupational titles and page number for each occupation.

Each Volume of Occupational Information contains an additional item, the "Wage Table." This table converts hourly wages to weekly, monthly, and annual wages.

Use the occupational information to learn about the requirements of various occupations that appear interesting. Think about how these occupations relate to skills, interests and attitudes toward work, leisure time, and personal life styles.

There are many career possibilities. It is not unusual for people to change their minds several times while considering a career. They may also change jobs several times during their lifetime. It is important, however, to decide on a direction for a career. NCIS can be a helpful tool in this process.

OCCUPATIONS

1101 PUBLIC ADMINISTRATORS

OCCUPATIONAL DESCRIPTION

Public administrators manage, coordinate, and direct public services and programs to meet national, state, or community needs. They analyze problems with the help of staff in public agencies and recommend solutions to governing bodies. They may plan and direct specific programs or operations. Some control financial or personnel activities. They often prepare and present reports, talk to citizens groups, and attend public meetings. They also propose laws and regulations and interpret laws and policies.

HOLLAND CODE

ESR (Enterprising, Social Realistic)

SPECIALTIES

Contact Representatives (169.167-018)
Park Rangers (169.167-042)
Legislative Assistants (169.167-066)
Deputy Insurance Commissioners (186.117-022)
Public Health Service Officers (187.117-050)
Recreation Superintendents (187.117-054)
Business-Enterprise Officers (188.117-014)
Civil Preparedness Officers (188.117-022)
Public Works Commissioners (188.117-030)
Agricultural Services Directors (188.117-038)
Arts and Humanities Council Directors (188.117-042)
Council on Aging Directors (188.117-046)
Consumer Affairs Directors (188.117-050)
Correctional Agency Directors (188.117-054)
Compliance Directors (188.117-058)
Law Enforcement Directors (188.117-070)
Licensing and Registration Directors (188.117-074)
Revenue Directors (188.117-090)
Economic Development Coordinators (188.117-102)
City Managers (188.117-114)
Police Commissioners I (188.117-118)
Welfare Directors (188.117-126)
Court Administrators (188.117-130)
Appraisers (188.167-010)
Classification and Treatment Directors (188.167-026)
Safety Council Directors (188.167-034)
Election Assistants (188.167-050)
Federal Aid Coordinators (188.167-054)
Office Managers (188.167-058)
Park Superintendents (188.167-062)
Roads Supervisors (188.167-078)
Sanitation Superintendents (188.167-098)
Traffic-Safety, Administrators (188.167-102)
Fire Chiefs (373.117-010)
Police Chiefs (375.117-010)
Military Attaches (M11014)
Military Recreation Directors (M11013)
Military Law Enforcement Directors (M11012)
Military Emergency Management Officers (M11011)

NCIS RELATED OCCUPATIONS

1210	General Managers
12101	School Superintendents
12102	Hospital Administrators
12103	Institution Directors
1230	Personnel Managers
1310	Medicine and Health Managers
1344	Postmasters and Mail Superintendents
1359	Service Organizations Managers
1370	Administrative Services Managers

WORK ACTIVITIES

- Appoint or hire and supervise staff.
- Supervise activities of agency.
- Prepare and submit budgets.
- Plan for future development.
- Work under supervision of other officials.
- Serve as spokesperson for agency.
- Study current problems, report findings, and recommend solutions.
- Set agency policies.
- Interpret laws and policies.
- Provide information to the public.

APTITUDES

- Have above average verbal ability.
- Have ability to make decisions based on experience.
- Have ability to work well with people.
- Have average numerical ability.
- Have ability to often move from one task to another using a variety of skills.
- Have qualities of leadership.
- Have ability to work under stress.

WORK SETTING

Environment

Work mostly indoors in offices. Some specialties may include work outdoors part of the day.

Hours

Work forty or more hours a week. Many work more than 40 hours to meet deadlines. They also may have to attend night or out-of-town meetings.

Employers

City, county, state, and federal agencies; special districts dealing with matters such as public health and safety, environmental quality, water resources, economic programs, housing and urban development, and social services.

CONSIDERATIONS

- Require commitment to public service.
- Some public administrators elected to office.
- Positions carry prestige.

NEBRASKA EMPLOYMENT

About 9,876 public administrators are projected to be employed by 1991.

WAGES

Entry level wages reflect the public administrators ability to perform the duties in the occupational description through previous employment and education. Starting salaries in Nebraska range between $23,183 and $56,000. Nationally, salaries are somewhat lower reflecting state and local economics. Beginning salaries range between $20,000 and $35,000 for elected and appointed public administrators.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Outlook depends on the general economy and the amount of money available to public agencies. Currently, tight budgets mean limited openings.
- Competition for entry-level jobs may be very keen.

PREPARATION

SKILLS

- Knowledge of political systems and how they work to meet the needs and desires of citizens.
- Analyzing, planning, and organizing skills.
- Knowledge of financial management, personnel administration, program evaluation, and organizational theory.
- Speaking and writing skills.
- Knowledge of legal practices.

TRAINING

- Some public administrators have master's degrees plus several years of experience.
- For some entry-level jobs a bachelor's degree is the minimum education required.
- For some jobs any major is acceptable, but others may require a specific major such as public administration, business law, or engineering.

EDUCATIONAL PROGRAM

143	Banking and Finance
145	Business Administration and Management
251	Engineering
421	Law
448	Liberal Arts and Sciences
562	Public Administration
581	Social Sciences
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, government, economics, sociology, psychology, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 131-136.
Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.
Military Career Guide (1988-89 ed.), pp. 252, 315, 260, and 248.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1210 GENERAL MANAGERS

OCCUPATIONAL DESCRIPTION

General managers work as heads of businesses, firms, agencies, and other organizations. They often are appointed to their positions. They plan, organize, direct, and control the major functions of the organizations they represent. They accomplish these tasks through departmental managers and other executives whom they direct. They set policies and goals, plan budgets, and select staff.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

School Superintendents (099.117-022) (12101)
Transportation Directors (184.117-014)
Department Store Managers (185.117-010)
Brokerage Office Managers (186.117-034)
Presidents (189.117-026)
Vice Presidents (189.117-034)
Financial Institution Presidents (186.117-054)
Hospital Administrators (187.117-010) (12102)
Institution Directors (187.117-018) (12103)
Industrial Organization Managers (189.117-022)
Bakery Managers (189.117-046)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1220	Financial Managers
1230	Personnel Managers
1250	Marketing and Advertising Managers
1320	Industrial Production Managers
1342	Transportation Facilities Managers
1351	Food Service and Lodging Managers
13511	Hotel or Motel Managers
1359	Service Organizations Managers
1370	Administrative Services Managers

WORK ACTIVITIES

- Gather and examine data.
- Develop short-term and long-term plans and policies.
- Negotiate with other business representatives on the purchase of equipment or establishment of credit lines.
- Coordinate and supervise activities of subordinate staffs.
- Meet with other top managers of their organization to exchange views on the progress of the organization.
- Insure that goals are met and are in accordance with the corporate charter and government regulations.
- Substantial travel is often required.

APTITUDES

- Have ability to learn the procedures and details related to the operation of a business, institution, or organization.
- Have good verbal, numerical, and clerical abilities.
- Be able to plan and organize activities and supervise others.
- Be able to make decisions based on data, observation, and experience.
- Have qualities of leadership, diplomacy, and calmness under pressure.
- Be able to work with a variety of people and influence them.
- Be able to complete a variety of tasks.

WORK SETTING

Environment
Work indoors in offices and meeting rooms.
Hours
Work 40 or more hours a week; hours may be long and irregular.
Employers
Large businesses, manufacturing companies, department stores, school districts, hospitals, clinics, government agencies and institutions, non-profit organizations, financial institutions, and transportation companies.

CONSIDERATIONS

- Jobs may offer prestige and personal satisfaction.
- Work may be stressful.
- Entry into these positions requires a combination of degree work plus several years of work experience.

NEBRASKA EMPLOYMENT

About 18,597 general managers are projected to be employed by 1991.

WAGES

Salary levels vary substantially depending upon the level of managerial responsibility, type, size and location of the firm, and the employment history and education of the individual. In Nebraska, entry level salaries range between $24,000 and $78,000 a year. Additional compensation in the form of a bonus, stock award and cash-equivalent fringe benefits are common in the private sector. Nationally, the estimated median salary of general managers and top executives is $40,200.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors

- Competition is keen and those with the most education and experience will have the best opportunities to find work.
- The outlook depends on economic stability, expansion of existing firms, creation of new businesses, and the need to fill vacancies within organizations.

PREPARATION

SKILLS

- Knowledge of procedures of administration of the organization involved with.
- Knowledge of financial management and policy planning and implementation.
- Skills in management, supervision, and communications.
- Skills in data collection and report writing.
- Skills in problem solving and decision making.
- Skills in public relations.

TRAINING

- Some employers will hire those with a bachelors degree as trainees and after years of experience may promote them to management positions.
- Those with masters degrees will find better employment opportunities.
- Most managers begin at lower-level positions and are promoted into management positions.

EDUCATIONAL PROGRAM

141	Human Resources Development
143	Banking and Finance
145	Business Administration and Management
146	Marketing
149	Office Supervision and Management
157	Accounting
562	Public Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, economics, sociology, psychology, business law, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 70, 112, 120, 123, 126, and 137.

Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.

Occupational Outlook Handbook (1990-91 ed.), p.32.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College Beatrice Campus
22711	Southeast Community College-Lincoln Campus

22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
44826	Teller Training Institute
44819	The Computer Classroom
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

12101 SCHOOL SUPERINTENDENTS

OCCUPATIONAL DESCRIPTION

School superintendents direct and coordinate the business and academic operations of city, county, or other school systems according to board of education standards. DOT 099.117-022

HOLLAND CODE

SEI (Social, Enterprising, Investigative)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers
12102	Hospital Administrators
12103	Institution Directors
1230	Personnel Managers
1281	College and University Administrators
1282	Elementary and Secondary Education Administrators
2201	College and University Teachers
2360	Instructional Coordinators

WORK ACTIVITIES

- Develop plans and policies for the educational program of a school district and submit them to the school board for approval.
- Carry out the plans and policies of the school district.
- Prepare and submit budgets for the school district.
- Oversee process of choosing and planning school sites and building construction and providing equipment and supplies.
- Serve as a spokesperson in matters relating to the school district.
- Explain plans and policies to principals, teachers, and community groups.
- Coordinate personnel practices and policies.
- May specialize as an assistant superintendent of personnel, business administration, or curriculum development

APTITUDES

- Be able to learn the principles and procedures in the administration of a school system.
- Have strong verbal and numerical abilities.
- Be able to plan and direct programs.
- Be able to make decisions based on observation and data.
- Have qualities of leadership, diplomacy, and calmness under pressure.
- Be able to compromise, work with people, and influence them.
- Be able to handle detailed paperwork.

WORK SETTING

Environment

Work indoors in offices and meeting rooms with frequent contacts in the community.

Hours

Work 40 to 60 hours a week with many evening and weekend activities.

Employers

Private and public school systems.

CONSIDERATIONS

- The job carries prestige.
- This job allows a person to be involved in problem solving and to enjoy the rewards of helping make an educational program more effective.
- Work includes long hours and may be stressful because of pressures and demands.
- Much public contact is required.

NEBRASKA EMPLOYMENT

About 2,278 educational administrators are projected to be employed by 1991. School superintendents are included in this group.

WAGES

Salaries of school superintendents vary widely according to education, experience, location and size of the school district. Entry level salaries in Nebraska range between $20,000 and $40,000 for superintendents of small districts and $30,000 to $50,000 for medium and larger metropolitan districts. Salaries in private parochial districts tend to be somewhat lower while salaries in private non-parochial districts tend to be somewhat higher. Nationally, entry level salaries compare favorably with Nebraska. The median annual salary for all education administrators who work full time is $36,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors

- Competition will be strong for the available positions because there are many qualified applicants.
- Any increases depend upon the size of the student population and on public financial support.
- Some openings will occur because a large number of public school administrators are reaching retirement age.

PREPARATION

SKILLS

- Knowledge of education methods, school law, budgets and accounting, and public relations.
- Skills in writing and public communications.
- Skills in planning, organizing, and supervision.
- Skills in decision making and problem solving.

LICENSING OR CERTIFICATION

- A certificate from the Nebraska Department of Education is required.
- To obtain a professional administrative and supervisory certificate, a person must have at least two years of teaching experience and either a six-year certificate or a doctoral degree in educational administration or supervision.

TRAINING

- Most states and employers require a masters degree in educational administration with either an elementary or secondary endorsement.
- Many states and employers require either a six-year certificate or a doctoral degree in educational administration or supervision.

EDUCATIONAL PROGRAM

141	Human Resources Development
231	Education Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, sociology, psychology, business law, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 70.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 32.

SCHOOLS

21102	Chadron State College
21504	Concordia College
21805	Creighton University
21311	Kearney State College
21821	University of Nebraska at Omaha
21711	University of Nebraska-Lincoln
21622	Wayne State College

12102 HOSPITAL ADMINISTRATORS

OCCUPATIONAL DESCRIPTION

The hospital administrator works with the governing board in establishing general policies and operating philosophy and provides direction to assistant administrators and department heads who carry out those policies. The administrator is responsible to the board to assure that the hospital runs efficiently, provides high quality medical care, and recovers adequate revenue to remain solvent or make a profit. DOT 187.117-010

HOLLAND CODE

SER (Social, Enterprising, Realistic)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers
12101	School Superintendents
12103	Institution Directors
1230	Personnel Managers
1310	Medicine and Health Managers

WORK ACTIVITIES

- Develop and direct programs such as preventive medicine, scientific research, staff training, and community health and welfare education.
- Administer hospital finances including budget planning, accounting, and setting hospital rates.
- Direct hiring and training of personnel.
- Coordinate the activities of hospital departments.
- Negotiate for improvements of and additions to medical services, buildings, and equipment.
- Represent the hospital within the community and promote programs.

APTITUDES

- Have ability to learn procedures related to the administration of a health facility.
- Have strong verbal and numerical abilities.
- Be able to work with a variety of people.
- Be able to supervise others and plan and organize programs.
- Have qualities of leadership, diplomacy, and calmness under pressure.
- Be able to make decisions based on observation and data.
- Be able to handle a variety of tasks and detailed paperwork.

WORK SETTING

Environment
    Work indoors in offices and various hospital areas; some travel may be necessary.
Hours
    Work 40 or more hours a week; may be called in for emergencies.
Employers
    Hospitals, health maintenance organizations, and government health facilities.

CONSIDERATIONS

- Job carries prestige and may provide personal satisfaction from contributing to better health care.
- Job involves a great deal of responsibility and pressure.

NEBRASKA EMPLOYMENT

About 1,106 medicine and health service managers are projected to be employed by 1991. Hospital administrators are included in this group.

WAGES

Entry level salaries for hospital administrators reflect the amount of education, previous administrative experience, the size, location and type of ownership of the hospital. In Nebraska beginning salaries range between $25,000 and $75,000 a year. Nationally, salaries compare favorably with a broader range of $20,000 to $85,000 a year. Salaries in Veterans Administration hospitals tend to be somewhat lower while salaries in university research and treatment facilities tend to be somewhat higher.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- Increased opportunities depend on the expansion of existing health care facilities.

the construction of new hospitals, the development of new services, and continued public interest in health care programs.

- Competition will be strong for people without graduate degrees.

PREPARATION

SKILLS

- Knowledge of procedures of administration of a health facility.
- Knowledge of financial management, purchasing, and fund raising.
- Skills in policy planning and implementation.
- Skills in management, supervision, and communications.
- Skills in public relations.
- Skills in problem solving and decision making.

TRAINING

- The minimum educational requirement is a bachelors degree, but competition in this field makes it necessary to have a masters degree in health services administration or hospital administration.
- People entering this field usually start as department heads or assistant administrators.

EDUCATIONAL PROGRAM

141	Human Resources Development
145	Business Administration or Management
162	Health Services Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, sociology, psychology, health, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 126.
Guide for Occupational Exploration (2nd ed., 1984), pp.550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 35.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

12103 INSTITUTION DIRECTORS

OCCUPATIONAL DESCRIPTION

Institution directors manage the administration of prisons, clinics, nursing homes, and other institutions. DOT 197.117-018

HOLLAND CODE

SER (Social, Enterprising, Realistic)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers
12101	School Superintendents
12102	Hospital Administrators
1230	Personnel Managers
1310	Medicine and Health Managers
2032	Social Workers

WORK ACTIVITIES

- Direct the overall operation of the facility.
- Coordinate the various programs and departments.
- Direct hiring and training of personnel.
- Establish policies and regulations with staff.
- Collect and analyze data and prepare reports.
- Prepare budgets.
- May raise funds and negotiate with boards or agencies.
- May represent the institution in the community.
- May help determine who is accepted into or discharged from the institution.

APTITUDES

- Have ability to learn the procedures and details related to the operation of an institution.
- Have good verbal abilities in reading, writing, and speaking.
- Have good numerical and clerical abilities.
- Be able to plan and organize projects and supervise others.
- Be able to make decisions and handle stressful situations.

WORK SETTING

Environment

Work indoors in offices or other areas of the institution.

Hours

Work 40 or more hours; hours may be long and irregular; may be called in for emergencies.

Employers

Nursing homes, prisons, clinics, government agencies, rehabilitation centers, orphanages, and other institutions.

CONSIDERATIONS

- Job carries prestige and may be rewarding.
- Work may cause mental and emotional strain.
- May have to submit to an extensive background investigation.

NEBRASKA EMPLOYMENT

About 17,701 general managers are projected to be employed by 1991. Institution directors are included in this group.

WAGES

Beginning salaries for institution directors are somewhat lower than other managerial and administrative occupations. In Nebraska, entry level salaries range between $17,000 and $35,000 a year. Many institution directors are hired with a full maintenance package including salary, housing and transportation. Previous experience will, in many cases, be substituted for education in determining the starting salary. Nationally, entry level salaries range between $22,000 and $48,000.

EMPLOYMENT GROWTH

Nebraska

Somewhat Favorable

National

Somewhat Favorable

Factors

- Job opportunities are affected by the amount of money spent on social services which is influenced by economic changes and political policies.
- Because of strong competition, opportunities will be best for those with graduate degrees.

PREPARATION

SKILLS

- Knowledge of the procedures of administration of an institution.
- Skills in policy planning and implementation.
- Skills in management, supervision, and communications.
- Skills in problem solving and decision making.
- Skills in public relations.

LICENSING OR CERTIFICATION

- Nursing home administrators must be licensed by the Nebraska Board of Examiners in Nursing Home Administration.
- Applicants must be 18 years old, not convicted of a felony, be in good mental and physical condition, have a high school diploma or equivalent, have a bachelors degree in health service administration or an associate degree with six months supervised training, and pass an exam.
- Fifty hours of continuing education are required every two years.

TRAINING

- Some employers will hire people with an associate degree.
- Most employers require a bachelors or graduate degree in human services, public administration, or health services administration.
- People often start at lower positions within the institution and advance within the ranks.

EDUCATIONAL PROGRAM

141	Human Resources Development
145	Business Administration and Management
162	Health Services Administration
562	Public Administration
565	Social Work

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, sociology, psychology, health, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 126.

Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1220 FINANCIAL MANAGERS

OCCUPATIONAL DESCRIPTION

Financial managers are in charge of departments that handle money earned and spent by companies, government agencies, or organizations. They help companies, agencies, and organizations use money wisely and ensure smooth business operations.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Treasurers (161.117-018)
Controllers (186.117-014)
Financial Institution Managers (186.117-038)
Financial Institution Treasurers (186.117-070)
Financial Institution Vice Presidents (186.117-078)
Credit Card Operations Managers (186.167-022)
Credit Union Managers (186.167-026)
Reserve Officers (186.167-054)
Military Financial Managers (M12200)

NCIS RELATED OCCUPATIONS

1210	General Managers
1412	Accountants and Auditors
1415	Loan Officers
1912	Economists

WORK ACTIVITIES

- Prepare budgets and financial forecasts.
- Direct and coordinate activities to carry out institution's policies and procedures.
- Direct activities of workers who may be involved in accounting, data processing, recording financial transactions, setting up trust accounts, probating estates, or administering mortgage and trust accounts.
- Set financial procedures to insure safekeeping of assets.
- Develop relations with customers, community, and civic organizations.

APTITUDES

- Have strong verbal ability in reading, writing, public speaking, and communicating with individuals.
- Have strong numerical ability.
- Be able to handle detailed paperwork.
- Be able to make decisions based on data and practical applications.
- Be able to plan policies, coordinate activities, and supervise employees.
- Have ability to move often from one task to another using a variety of skills.

WORK SETTING

Environment
Work indoors in office settings with some community contacts.

Hours
Work usually at least 40 hours a week with extra evening and weekend responsibilities.

Employers
Banks, savings and loan associations, trust companies, credit agencies, credit unions, and non-profit and government organizations.

CONSIDERATIONS

- Involves working with data, business procedures, and financial policy-making.
- May involve long hours and much pressure.
- Carries high level of prestige.
- A surplus of managers exists due to mergers, consolidations and the failure of several savings and loans.

NEBRASKA EMPLOYMENT

About 5,623 financial managers are projected to be employed by 1991.

WAGES

Beginning salaries for workers with little or no experience in Nebraska range between $15,000 and $30,000 a year. The location and size of the financial institution as well as the educational background of the worker will determine the starting salary. Nationally, average beginning salaries range between $22,000 and $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable

National
Favorable
Factors

- Expansion of banking services will increase the need for managers.
- Need for financial managers grows during slow economic periods.
- Growth will occur as new businesses start and existing businesses expand and try to operate more efficiently.

PREPARATION

SKILLS

- Knowledge of accounting, credit policies, computer processing, and institution policies and operations.
- Skills in administration and finance.
- Ability to develop long-range goals and objectives.
- Knowledge of federal and state laws and city codes and ordinances.
- Ability to express ideas, proposals, and recommendations effectively both orally and in writing.

TRAINING

- Bachelors degree in banking and finance or business administration is needed.
- Masters degree will make person more competitive.
- Several years of experience necessary.
- Person will often start as trainee and then rise through the ranks of the institution.

EDUCATIONAL PROGRAM

143	Banking and Finance
145	Business Administration and Management
157	Accounting
421	Law
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in business math, business law, government, economics, accounting, marketing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 93 and 122-124.

Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.

Military Career Guide (1988-89 ed.), p. 253.

Occupational Outlook Handbook (1990-91 ed.), p. 30.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
44825	Omaha Career Center
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
44826	Teller Training Institute
44819	The Computer Classroom
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1230 PERSONNEL MANAGERS

OCCUPATIONAL DESCRIPTION

Personnel managers manage programs related to employment and treatment of workers. They set company policy on employment, pay, and training of workers. They make sure workers are informed of their employment rights and benefits. Some plan and direct employee relations, benefits, training, or staff development programs. Some manage a company's safety, insurance, or pension program. Some direct a personnel office. These workers supervise staff, keep records, and write reports. DOT 166.117-018

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

SPECIALTIES

Industrial Relations Directors (166.117-010)
Benefits Managers (166.167-018)
Education and Training Managers (166.167-026)
Employment Managers (166.167-030)
Military Personnel Managers (M12300)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers
12101	School Superintendents
12102	Hospital Administrators
12103	Institution Directors

WORK ACTIVITIES

- Recruit, interview, and hire employees.
- Plan and carry out employee orientations.
- Keep records of insurance coverage and pension plans.
- Evaluate the progress of employees.
- Prepare operating budget for personnel department.
- Look into grievances and advise supervisors on labor problems.
- Represent organization in union negotiations or in labor disputes.
- Help develop staffing patterns.
- Help maintain good working relationships between employers and employees.
- Keep complete and accurate personnel files.

APTITUDES

- Be able to learn the details of the company's operation, interviewing and hiring practices, and labor and union laws.
- Have very good verbal abilities to communicate with employees, employers, and union officials.
- Have ability to understand the results of tests and evaluation methods used in interviewing, job analysis reports, and wage and benefit descriptions.
- Be able to supervise others and make judgements based on observations and the qualifications of applicants.
- Be able to analyze problems relating to employees, interpret company policies to employees, and direct personnel programs.
- Be able to do detailed paper work and work with data.
- Be able to work well with people and influence them.

WORK SETTING

Environment
    Work indoors in offices.
Hours
    Work generally 40 hours a week.
Employers
    Industrial and business firms, government agencies, colleges and universities, department stores, service organizations, employment agencies, hospitals, insurance and investment companies, and labor organizations.

CONSIDERATIONS

- Job requires someone who is both business minded and able to understand people of varying intelligence, ability, and education levels.
- Job may involve stress, pressure, and conflict.
- Job carries prestige and may bring personal satisfaction.

NEBRASKA EMPLOYMENT

About 1,321 personnel managers are projected to be employed by 1991.

WAGES

Salaries for personnel managers vary widely and depend upon the size and location of the firm and the nature of the business. In Nebraska, entry level salaries in the private sector range between $15,000 and $33,000 per year. Personnel managers employed by the State of Nebraska may enter at a pay grade with a range of $20,144 to $28,202. Nationally, entry level salaries range between $21,000 and $46,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors

- Government regulations in the areas of safety, health, benefits and equal opportunity employment have increased the need for personnel workers.
- The need for these workers is affected by economic conditions and political trends.
- Demand is best for experienced specialists who have technical, industrial, or labor negotiations backgrounds.
- Opportunities for beginners applying for entry jobs are limited and competition is strong.

PREPARATION

SKILLS

- Knowledge of interviewing techniques, evaluation procedures, and government regulations and laws relating to employment.
- Skills in supervision, management, and communications.
- Ability to conduct wage surveys and job analysis activities, keep personnel records, and schedule work hours.

TRAINING

- Bachelors degree in personnel or business administration is required in most cases.
- Personnel managers in government agencies may need a masters degree in public administration.
- Experience is an asset and is sometimes required.
- People may start in a department as an interviewer or job analyst and move up through the ranks.

EDUCATIONAL PROGRAM

141	Human Resources Development
145	Business Administration and Management
541	Psychology
562	Public Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in government, sociology, psychology, business law, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 98-100.
Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.
Occupational Outlook Handbook (1990-91 ed.), p. 48.
Military Career Guide (188-89 ed.), p. 257.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College

21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1250 MARKETING AND ADVERTISING MANAGERS

OCCUPATIONAL DESCRIPTION

Marketing and advertising managers supervise marketing, sales, advertising, or public relations departments for businesses and other organizations. They develop policies and programs for promoting the sales of a firm's products or services. They plan, organize, and direct departmental activities; train, supervise, and evaluate staff; and deal with business and other groups to promote sales. They study sales records and prepare progress reports and plan and direct advertising sales campaigns.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Advertising Managers (163.167-010) (164.117-010)
Sales Managers (163.167-018)
Field Representatives (163.267-010)
Advertising Agency Managers (164.117-014)
Account Executives (164.167-010)
Vehicle Leasing and Rental Managers (187.167-162)

NCIS RELATED OCCUPATIONS

1210	General Managers
1442	Wholesale and Retail Buyers
19121	Market-Research Analysts I
32207	Merchandise Displayers
3320	Public Relations Specialists
4030	Retail Sales Supervisors
4153	Advertising Sales Representatives

WORK ACTIVITIES

- Design sales policy and programs of advertisement.
- Organize sales distribution through territories, goals, and quotas.
- Prepare and review market analysis.
- Analyze sales statistics and prepare sales reports.
- Direct workers in marketing research, advertisement, and sales.
- Represent company at meetings in order to promote sales.
- Direct the distribution of products and services to customers in order to increase business.

APTITUDES

- Be able to learn the details of sales and promotion in the company.
- Have above average verbal ability to talk with company administrators, employees, and customers.
- Have numerical ability to compile and analyze sales statistics and make market analysis to determine prices and discounts.
- Be able to supervise employees and influence customers to buy products or services.
- Be able to make decisions and judgments based on observation.
- Enjoy working with people, data, and business information.

WORK SETTING

Environment

Work indoors in an office; may do some traveling.

Hours

Work 40 to 60 hours a week; hours may be irregular and include evenings and weekends.

Employers

Companies and businesses that sell services or products, advertising agencies, banks, television and radio stations, and newspapers.

CONSIDERATIONS

- Job may require several years of sales experience.
- Job involves long hours, frequent travel, and pressure.
- Job may involve meeting with many people.
- Job may carry prestige.

NEBRASKA EMPLOYMENT

About 2,647 marketing and advertising managers are projected to be employed by 1991.

WAGES

Entry level salaries vary substantially depending upon the level of managerial responsibility, prior experience, and size and location of the firm. For sales managers, the extent of their sales territory is another important factor. Starting salaries in Nebraska range between $16,000 and $30,000 per year. Additional compensation in the form of bonuses equal to ten percent of the annual salary are not uncommon. National entry level salaries tend to be only slightly higher with a range of $17,500 to $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Favorable
Factors
- Growth in retail business should provide more opportunities.
- The sales field is affected by changes in the economy.
- Many jobs are filled by promotion within an organization.

PREPARATION

SKILLS

- Knowledge of marketing, advertising, and the product or service being sold.
- Skills in selling and promotion.
- Skills in directing and inspecting the work of others.

TRAINING

- Bachelors degree is preferred.
- Courses in business, marketing, public relations, advertising, and communications are helpful.
- Experience in sales and management is usually necessary.

EDUCATIONAL PROGRAM

145	Business Administration and Management
146	Marketing
193	Journalism and Communications
441	English
541	Psychology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, psychology, marketing, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 96 and 97.

Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.

Occupational Outlook Handbook (1990-91 ed.), p. 46.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1281 COLLEGE AND UNIVERSITY ADMINISTRATORS

OCCUPATIONAL DESCRIPTION

College and university administrators plan, organize, and direct activities and programs in a college or university. They work as deans or as directors of admissions, athletics, alumni, or other departments. They establish policies, programs, and standards for the departments they represent. They select and supervise staff, prepare budgets and schedules, and evaluate programs and services. They hold departmental meetings and advise on matters related to their assigned areas. They also take part in school functions and promote good public relations.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Academic Deans (090.117-010)
Deans of Students (090.117-018)
Athletic Directors (090.117-022)
Financial-Aid Officers (090.117-030)
Directors of Admissions (090.167-014)
Directors of Student Affairs (090.167-022)
College or University Registrars (090.167-030)
College or University Business Managers (186.117-010)
Military Education and Training Directors (M12810)

NCIS RELATED OCCUPATIONS

12101	School Superintendents
1282	Elementary and Secondary Education Administrators
2201	College and University Teachers
2360	Instructional Coordinators

WORK ACTIVITIES

- Direct and coordinate student programs.
- Develop student personnel policies.
- Advise staff members on problems relating to policies, programs, and administration.
- Direct and assist in planning social, recreational, and curricular programs.
- Develop academic policies and programs.
- Direct and coordinate activities of deans and chairpersons of individual colleges.
- Determine scheduling of courses.
- Determine admissions and registration policies and counseling programs.
- Gather, examine, and analyze data.

APTITUDES

- Have ability to learn procedures and principles of educational administration on the college and university level.
- Have good verbal and numerical abilities.
- Be able to plan and direct projects and supervise others.
- Be able to handle a variety of tasks and detailed paperwork.
- Have qualities of leadership and diplomacy and the ability to remain calm under pressure.
- Be able to handle large work loads.

WORK SETTING

Environment
Work indoors in offices; some travel may be necessary.
Hours
Work 40 or more hours a week; some evening and weekend hours may be required.
Employers
Private and public colleges and universities.

CONSIDERATIONS

- Job may offer prestige and job satisfaction.
- Work may be stressful and include long, irregular hours.

NEBRASKA EMPLOYMENT

About 2,278 educational administrators are projected to be employed by 1991. College and university administrators are a part of this group.

WAGES

Starting salaries from college and university administrators vary according to position, amount of responsibility, prior administrative experience, and the location and size of the institution. Average entry level salaries in Nebraska as well as nationally range between $21,000 to $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors

- The number of openings will be affected by the levels of growth in college student enrollment and the levels of funding.
- Most college and university administrators must have a doctoral degree plus extensive administrative experience.

PREPARATION

SKILLS

- Knowledge of educational administration, law, budgeting, and public relations.
- Skills in communication.
- Skills in supervision and management.
- Skills in planning, organizing, and decision making.
- Skills in report writing and record keeping.

TRAINING

- The minimum educational requirement is usually a masters degree in student personnel, higher education administration, and business or public administration plus several years of experience.
- Many employers require a doctoral degree plus experience.
- This is usually not an entry-level position and requires several years of experience at lower-level positions before being promoted.

EDUCATIONAL PROGRAMS

143	Banking and Finance
145	Business Administration and Management
231	Education Administration
562	Public Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, sociology, psychology, accounting, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 66-67.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.
Military Career Guide (1988-89 ed.), p. 251

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1282 ELEMENTARY AND SECONDARY EDUCATION ADMINISTRATORS

OCCUPATIONAL DESCRIPTION

Elementary and secondary education administrators direct educational, administrative, and counseling activities and make sure that school programs meet state and school board standards. They plan school programs, enforce school rules, assign teachers and pupils to classes, and counsel students on personal and academic matters. They also order school supplies and equipment.

HOLLAND CODE

SEA (Social, Enterprising, Artistic)

SPECIALTIES

Dean of Students (091.107-010)
Principals (099.117-018)

NCIS RELATED OCCUPATIONS

12101	School Superintendents
1281	College and University Administrators
2201	College and University Teachers
2320	Elementary School Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators

WORK ACTIVITIES

- Provide leadership to teaching staff by planning staff development, supervising classrooms, reviewing teaching activities, and giving motivation and support.
- Coordinate and evaluate educational programs.
- Assign teaching schedules, write budgets, and order books and other supplies.
- Meet with teachers, parents, and students about behaviors and academics.
- Represent the school to the community, work with parent and community groups, and relate to other administrators.
- Supervise activities of clerical staff, direct the welfare of the student body, and carry out the policies of the school system.

APTITUDES

- Have ability to learn principles of educational administration.
- Have good verbal and numerical skills.
- Be able to organize activities, plan programs, and solve problems.
- Be able to make decisions based on observations and practical application of theory.
- Be able to handle detailed paperwork, relate well to both youth and adults, and provide leadership.
- Have qualities of tact, calmness under pressure, persuasiveness, and interest in helping children or young people in development.

WORK SETTING

Environment
Work indoors in school buildings and offices with occasional contacts in the community.
Hours
Work 40 to 60 hours a week with frequent weekend and evening activities.
Employers
Private and public school systems

CONSIDERATIONS

- Work may involve pressures and demands from parents, students, teachers, and community groups.
- Work may be stressful and require long hours.
- The job carries prestige and offers the rewards of helping in the development of teachers and students.

NEBRASKA EMPLOYMENT

About 2,278 educational administrators, including principals, are projected to be employed by 1991.

WAGES

Salaries of education administrators vary according to position, level of responsibility and experience, and the size and location of the school. Entry level salaries in Nebraska range between $20,000 and $54,000 a year. Salaries in private parochial schools tend to be somewhat lower while salaries in private non-parochial tend to be somewhat higher. National average entry level salaries compare favorably with Nebraska with a range of $30,000 to $55,000 per year. The median annual salary for education administrators who work full time is $36,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Unfavorable
Factors

- The expected decline in school enrollments will decrease the need for people in this field.
- Growth depends on public financial support.
- Some growth will occur because a large number of school administrators are reaching retirement age and as educational services are expanded to include other groups in the community.
- Competition for available positions will be strong.

PREPARATION

SKILLS

- Knowledge of education methods, budgets, accounting, and school law.
- Skills in management, supervision, decision-making, and group dynamics.
- Skills in problem-solving, negotiating, and responding to the needs of students and community.

LICENSING OR CERTIFICATION

- Standard administrative and supervisory certificate from the Department of Education is required in Nebraska.
- Qualifications include at least two years of teaching experience and either a masters degree or a six-year certificate in educational administration with an endorsement in either elementary or secondary education.

TRAINING

- Most schools require a masters degree in educational administration with either an elementary or secondary endorsement.
- Some large districts expect principals to have doctoral degrees.
- Other districts prefer that principals have six-year certificates in educational administration.

EDUCATIONAL PROGRAM

231 Education Administration

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, sociology, psychology, child care, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 67 and 70.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 25.

SCHOOLS

21102	Chadron State College
21504	Concordia College
21805	Creighton University
21311	Kearney State College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

1310 MEDICINE AND HEALTH MANAGERS

OCCUPATIONAL DESCRIPTION

Medicine and health managers are in charge of medical and health services in places such as hospitals, clinics, businesses, or schools. Some direct the nursing services of a community health agency, hospital, or industrial firm. Some are in charge of the educational program of a nursing school. Some direct the medical records system of a hospital, clinic, or health center. Some administer a medical emergency service program. These managers prepare budgets, hire staff, and plan and direct health care services. They also keep records, prepare reports, and evaluate medical services and staff.

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Community-Health Nursing Directors (075.117-014)
Nursing Service Directors (075.117-022)
Occupational Health Nursing Directors (075.117-026)
School of Nursing Directors (075.117-030)
Emergency Medical Services Coordinators (079.117-010)
Medical Record Administrators (079.167-014)
Outpatient Services Directors (187.117-058)
Radiology Administrators (187.117-062)
Military Health Services Administrators (M13100)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
12102	Hospital Administrators
12103	Institution Directors
2901	Registered Nurses
3640	Health Record Technicians

WORK ACTIVITIES

- Gather information about the need for nursing services in a community.
- Plan a nursing services program that will meet a community's needs.
- Recruit, select, and assign nurses.
- Set up training programs for hospital nurses.
- Recommend changes in hospital policies.
- Set up record systems for the health services department of an industrial plant.
- Interview and hire new staff for nursing school.
- Keep records on student nurses and arrange for them to use hospital facilities.
- Explain hospital nursing services to staff and community groups.
- Direct workers who rescue and care for accident victims.
- Develop training programs for rescue workers.
- Plan a medical record system for a health care center.
- Develop training materials.
- Supervise workers who prepare and process materials.

APTITUDES

- Be able to learn principles and methods of administration in a given area.
- Have strong verbal and numerical abilities.
- Be able to relate to people and supervise others.
- Be able to make decisions based on data and experience.
- Be able to work within precise standards and set procedures.

WORK SETTING

Environment
 Work indoors in offices.
Hours
 Work 40 or more hours a week; schedule may be irregular or rotating and include evening and weekend hours.
Employers
 Hospitals, clinics, other health care facilities, nursing schools, social service agencies, government health or medical services programs, and industrial firms.

CONSIDERATIONS

- Job may provide personal satisfaction from contributing to better health care.
- Job may involve a great deal of responsibility.

NEBRASKA EMPLOYMENT

About 1,106 medicine and health service managers are projected to be employed by 1991.

WAGES

Entry level salaries vary with experience of employee and size, location, and type of institution. In Nebraska, beginning salaries range between $16,250 and $27,500 a year. Average beginning salaries nationally are higher than Nebraska with a range of $25,500 to $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Favorable
Factors

- Increased opportunities depend on the expansion of health care facilities and services and continued public interest in health care programs.
- Most of these managers are trained for and work at lower-level positions before being promoted after years of experience and specialized training.

PREPARATION

SKILLS

- Knowledge of the practices and procedures of the specific field being managed such as nursing or medical records.
- Skills in communications.
- Skills in working with a variety of people.
- Skills in planning and implementing projects and supervising others.
- Skills in decision making and record keeping.

TRAINING

- Most employers require at least a bachelors degree in the specific area being managed plus several years of work experience.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Most medical and health managers are promoted from lower-level positions and have advanced training and many years of work experience.

EDUCATIONAL PROGRAM

162	Health Services Administration
163	Medical Records Technology
353	Nursing
381	Emergency Medical Technology
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, sociology, psychology, health, health occupations, data processing, and office education.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 56, 63, and 64.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 35.
Military Career Guide (1988-89 ed.), p. 255.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21311	Kearney State College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College

22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1320 INDUSTRIAL PRODUCTION MANAGERS

OCCUPATIONAL DESCRIPTION

Industrial production managers plan and direct production activities in plants and factories. They set work procedures and work through departmental supervisors to control the production, distribution, and marketing of goods. They hire and fire workers and keep work records. They review progress reports and reschedule work so that deadlines can be met. They interpret and enforce company rules and regulations. They also direct the training and assignment of workers and prepare budgets and reports for management.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Superintendents (180.167-054)
Bulk Plant Managers (181.117-010)
Concrete-Mixing Plant Superintendents (182.167-022)
Branch Managers (183.117-010)
Production Superintendents (183.117-014)
Milling General Superintendents (183.167-014)
General Supervisors (183.167-018 or 022)
Food Processing Plant Managers (183.167-026)
Maintenance Superintendents (189.167-046)

NCIS RELATED OCCUPATIONS

1210	General Managers
1330	Construction Managers
1341	Communications Operation Managers
1342	Transportation Facilities Managers
1634	Industrial Engineers

WORK ACTIVITIES

- Supervise production workers either directly or indirectly.
- Help set standards for production and quality control.
- Develop budgets and cost controls.
- Plan and direct production activities and develop methods for operation.
- Design procedures to improve the quality of the product and production.
- Set production priorities and schedules.
- Supervise maintenance of plant equipment.
- Keep records.

APTITUDES

- Be able to learn details of production operations.
- Be able to read and prepare written reports.
- Be able to work with numbers.
- Have good space and form perception.
- Be able to keep good records.
- Be able to do light typing.
- Be able to coordinate, direct, and supervise activities.
- Be able to make decisions based on experience.
- Be able to perform a variety of tasks in a short period of time.

WORK SETTING

Environment
Work indoors in plants or factories.
Hours
Work usually 40 hours a week; sometimes work evenings and weekends to meet deadlines.
Employers
Industrial and manufacturing firms.

CONSIDERATIONS

- Working around production areas may be noisy.
- Worker may handle personnel problems.
- Job may carry prestige.
- Job includes much decision-making.
- Jobs are not entry-level.

NEBRASKA EMPLOYMENT

About 869 industrial production managers are projected to be employed by 1991.

WAGES

Starting wages for industrial production managers vary widely with the size of the firm, industry, level of responsibility, and experience. Additional compensation in the form of bonuses or shares of profit are not uncommon. Starting salaries in Nebraska range from $15,000 to $25,000 a year. Because most industrial

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managers are promoted from within, starting salaries tend to be at the upper end of the scale. National averages tend to be higher than Nebraska due to heavier concentration of industry in coastal areas. Salaries range between $22,000 and $47,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors

- There are usually fewer job openings in this occupation when the economy shows a slow growth.
- Jobs in the future may require technical training and/or familiarity with computer-assisted manufacturing systems, such as robotics.

PREPARATION

SKILLS

- Knowledge of industry, equipment, and manufacturing processes.
- Skills in coordinating people, materials, and time.
- Knowledge of business and budget management.
- Ability to relate to people in both labor and management.

TRAINING

- Nearly all production superintendents come up through the ranks in the company after several years of experience.
- Bachelors degree is usually preferred.
- Some employers accept a two-year degree plus work experience in supervision.
- Study in industrial engineering, industrial technology, industrial management, or business administration is helpful.

EDUCATIONAL PROGRAM

145	Business Administration and Management
251	Engineering
253	Engineering Technologies
287	Industrial Mechanics
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, manufacturing, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 109-111 and 138.
Guide for Occupational Exploration (2nd ed., 1984), pp. 171-175.
Occupational Outlook Handbook (1990-91 ed.), p. 39.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
11959	Hawkeye Institute of Technology
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
22512	Southeast Community College-Milford
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1330 CONSTRUCTION MANAGERS

OCCUPATIONAL DESCRIPTION

Construction managers direct construction operations for firms that build and repair structures such as buildings, bridges, roads, and dams. They work through on-site supervisors to plan and direct construction activities. They study building plans and estimate the materials, labor, and equipment needed to complete the project. They set work procedures, order supplies and materials, review progress reports, and make decisions on staff and equipment requests. They also handle technical matters and union and service contracts.

HOLLAND CODE

ERS (Enterprising, Realistic, Social)

SPECIALTIES

Contractors (182.167-010)
Landscape Contractors (182.167-014)
Railroad-Construction Directors (182.167-018)
Construction Superintendents (182.167-026)
Maintenance-of-Way Superintendents (182.167-030)
Bridges and Buildings Supervisors (182.167-034)

NCIS RELATED OCCUPATIONS

1320	Industrial Production Managers
1342	Transportation Facilities Managers
1472	Construction Inspectors
1610	Architects
16101	Landscape Architects
1628	Civil Engineers

WORK ACTIVITIES

- Estimate costs of materials, labor, and use of equipment needed to complete a project.
- Prepare bids.
- Determine terms of contracts with clients.
- Subcontract specialized craft work such as electrical, concrete, and plumbing work.
- Buy materials and tools for construction.
- Supervise workers directly or indirectly through supervisors.
- Inspect projects and prepare reports on materials used, costs, and progress.
- Recruit and hire workers.
- Study blueprints to plan procedures for construction.

APTITUDES

- Be able to learn the basics of the construction industry.
- Be able to use words to communicate with clients and employees, prepare bids, and order materials.
- Be able to use numbers to estimate costs of materials and labor, calculate bids, and purchase materials.
- Be able to follow blueprints and manuals.
- Have good space and form perception and ability to pay attention to details and do paperwork tasks.
- Be able to handle a variety of tasks and make decisions based on data.
- Be able to relate well to a variety of people and supervise workers.
- Be in good physical condition.

WORK SETTING

Environment
Work indoors in offices and in buildings under construction.

Hours
May work more than 40 hours a week with the longer hours during summer months and busy periods.

Employers
Construction and contracting firms, utility companies, individual contractors, government agencies, engineering firms, architects, industries, and self-employed.

CONSIDERATIONS

- Work takes place in all kinds of weather and may be around noise and hazards.
- Living conditions near job site may be primitive.
- Travel is often necessary.
- Job offers prestige and chance to earn good income.
- Job offers feelings of achievement and reward from seeing projects completed.
- Job may be stressful.

NEBRASKA EMPLOYMENT

About 1,531 construction managers are projected to be employed by 1991.

WAGES

Starting wages reflect the trend in the construction field to promote experienced workers from within the company to this position. In Nebraska, salaries range between $14,600 and $27,000 per year depending on amount of experience and education and the size of the company. National averages range between $15,000 and $35,000 a year. Salary figures at the low end of the scale reflect seasonal lay-offs for some types of construction.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors
- The building industry is greatly affected by general economic conditions; as the economy improves, so will the demand for construction managers.

PREPARATION

SKILLS

- Knowledge of construction methods, equipment, and materials.
- Skills in blueprint reading, estimating, drafting, and engineering mechanics.
- Ability to relate to all kinds of people, supervise workers, and communicate with architects and engineers.
- Knowledge of building codes and business law.

TRAINING

- Construction experience is necessary.
- Some workers first complete apprenticeships and, after working as skilled workers, advance to supervisors, then to superientendents.
- Some employers prefer workers who have college training in civil engineering, construction management, business, or architecture.

EDUCATIONAL PROGRAM

115	Horticulture and Landscaping
131	Architecture and Environmental Design
133	Interior Design
145	Business Administration and Management
251	Engineering
288	Construction Trades
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, geometry, construction, drafting, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 109-110.
Guide for Occupational Exploration (2nd ed., 1984), pp. 171-175 and 571-574.
Occupational Outlook Handbook (1990-91 ed.) p. 21.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business

21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1341 COMMUNICATIONS OPERATIONS MANAGERS

OCCUPATIONAL DESCRIPTION

Communications operations managers direct the activities in telephone, telegraph, radio, television, or other companies involved with communications. They plan, organize, and direct departmental activities. They set work procedures, select staff, and coordinate activities between departments. They review operations, enforce regulations, prepare reports and budgets, and advise management on problems and trends. They also handle technical matters and union and service contracts.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Station Managers (184.117-062)
Operations Managers (184.117-070)
CommunicationsSuperintendents(184.117-082)
Cable Supervisors (184.161-010)
Operations Directors (184.167-018)
Telegraph Office Managers (184.167-086)
Traffic Managers (184.167-090)
Supervisor of Communications (184.167-230)
Technical Directors (962.162-010)
Military Communications Managers (M13410)

NCIS RELATED OCCUPATIONS

1320	Industrial Production Managers
32402	Television Directors
32404	Program Directors
3330	Radio and Television Announcers
3711	Electrical and Electronic Engineering Technicians
3930	Radio Operators

WORK ACTIVITIES

- Coordinate work of various departments to produce programs or complete projects.
- Supervise, directly or indirectly, personnel engaged in sales, programming, engineering, or personnel.
- Insure compliance with regulations.
- Conduct studies and analyze data in order to prepare reports and proposals.
- Interpret and implement company policies and develop operating procedures.
- Prepare budgets, determine work force requirements, and establish production schedules.
- Direct traffic operations in a communications system office.
- Oversee the construction, operation, and upkeep of a communication system.

APTITUDES

- Be able to learn the processes and procedures of communications operations.
- Have good verbal and numerical abilities.
- Be able to deal with a variety of people and supervise others.
- Have good space and form perception.
- Be able to plan and direct activities and handle a variety of responsibilities.
- Be able to make decisions based on observation and experience and work within set standards and time limits.

WORK SETTING

Environment

Work indoors in offices, studios, or production areas.

Hours

Work 40 or more hours a week; may be called upon to work during emergencies.

Employers

Telephone and telegraph companies, radio and television broadcasting companies, and businesses or organizations that operate their own communications systems.

CONSIDERATIONS

- Job may offer prestige.
- Most communications operations management positions are open to those with several years of experience.

NEBRASKA EMPLOYMENT

About 1,566 communications, transportation, and utilities managers are projected to be employed by 1991. Communications operations managers are a part of this group.

WAGES

Starting salaries for communications operations managers will reflect not only the amount of training beyond high school but more importantly, the amount of experience. In Nebraska, starting salaries range between $21,500 and $32,000 per year. Nationally, beginning salaries compare favorably with Nebraska with a range of $18,000 to $35,000 a year. Much higher salaries will be found in major metropolitan coastal locations.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Competition for available positions is expected to be strong.
- This occupational group should experience over five percent growth in the future.

PREPARATION

SKILLS

- Knowledge of communications operations and equipment.
- Knowledge of regulations.
- Skills in planning, directing, and supervising.
- Skills in decision making.
- Skills in collecting and analyzing data.
- Skills in programming and engineering.

TRAINING

- The minimum educational requirement is usually two years of technical training beyond high school.
- Most employers require training plus several years of experience in a related area.

EDUCATIONAL PROGRAM

145	Business Administration and Management
196	Communications Technology
292	Electrical and Electronics Equipment Repair

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including composition, government, media production, and electronics.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 113-114, 116, and 929.
Guide for Occupational Exploration (2nd ed., 1984), pp. 171-175, 188-219, and 566-570.
Military Career Guide (1988-89 ed.), p. 249.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
99804	Gateway Electronics Institute
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1342 TRANSPORTATION FACILITIES MANAGERS

OCCUPATIONAL DESCRIPTION

Transportation facilities managers are in charge of companies that provide trans-portation, delivery, storage, and related services. They may arrange the transport of raw materials to processing or production areas. Also, they may route outgoing and incoming freight. Some arrange to transmit radio and television programs to other stations or schedule advertising. Others arrange telephone traffic within a specific geographic area.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Airport Managers (184.117-026)
Automotive Services Managers (184.117-034)
Operations General Agents (184.167-042)
Bus Transportation Managers (184.167-054)
Traffic Managers (184.167-094)
Truck Terminal Managers (184.167-110)
Warehouse Managers (184.167-114)
Maintenance Superintendents (184.167-170)
Military Transportation Managers (M13420)
Military Transportation Maintenance Managers (M13421)
Military Supply and Warehouse Managers (M13422)

NCIS RELATED OCCUPATIONS

1210	General Managers
1320	Industrial Production Managers
1330	Construction Managers

WORK ACTIVITIES

- Plan, organize, and direct departmental activities.
- Establish work procedures and schedules.
- Select staff.
- Coordinate activities between departments.
- Review operations and enforce regulations.
- Prepare reports and budgets.
- Advise boards on problems and trends.
- Handle technical matters.
- Service union contracts.
- Determine routes and rates to be charged.

APTITUDES

- Be able to learn the procedures of transportation and related services.
- Have good verbal and numerical abilities.
- Have average space and form perception and physical coordination.
- Be able to handle a variety of activities.
- Be able to work with a variety of people and direct the activities of others.
- Be able to make decisions based on data, experience, and observations.
- Have ability to work within set standards.

WORK SETTING

Environment
Work indoors; travel may be required.
Hours
Work 40 hours a week; during emergencies longer, night, or weekend hours may be required.
Employers
Airports, shipping firms, bus and railroad companies, and warehouse and storage companies.

CONSIDERATIONS

- Most of these positions are open to people with several years of experience in a related field. This is usually not an entry-level position.

NEBRASKA EMPLOYMENT

About 1,566 communications, transportation and utilities managers are projected to be employed by 1991. Transportation facilities managers are a part of this group.

WAGES

Starting salaries for transportation facilities managers will be determined by the amount of experience of the worker promoted to this position, as well as the size and location of the facility. In Nebraska, salaries for recently promoted and new hires range between $17,800 and $30,000 a year. National starting salaries compare favorably with Nebraska with a slightly lower base of $15,500 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- Competition for available positions is expected to be strong.
- Very few openings will result from growth; most openings will result from replacement needs in this occupational group.

PREPARATION

SKILLS

- Knowledge of transportation services and facilities.
- Knowledge of laws and regulations that apply to transportation.
- Skills in planning, organizing, and supervising.
- Skills in preparing reports and budgets.
- Skills in solving problems.
- Skills in dealing with many types of people.

TRAINING

- Some employers require applicants to have one to four years of postsecondary training in management.
- Training in specialty occupations may be obtained through apprenticeship training.
- Most positions are filled by people who have several years experience in a related area.

EDUCATIONAL PROGRAM

145	Business Administration and Management
272	Air Transportation
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum and include courses in marketing, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 112, 113, 116, and 117.
Military Career Guide (1988-89 ed.), pp. 263, 265, and 266.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
99734	LinAire, Inc.
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
99833	Sky Harbor Air Service, Inc.
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1344 POSTMASTERS AND MAIL SUPERINTENDENTS

OCCUPATIONAL DESCRIPTION

Postmasters and mail superintendents administer the daily operations of post offices. They supervise post office staff, set up work schedules, and handle customer complaints. Some are responsible for the operation and management of several post offices. They hire and train post office managers and direct safety, finance, maintenance, and other programs for post offices in their districts. They also provide postal information to the public. DOT 188.167-066

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Postal Service Sectional Center Managers (188.167-086)
Military Postal Directors (M13440)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
4742	Postal Clerks
4743	Mail Carriers
4744	Mail Clerks

WORK ACTIVITIES

- Organize and supervise the processing of mail.
- Solve customer complaints.
- Inform the public of postal laws and regulations.
- Meet with supplies to get bids and place orders.
- Prepare and submit reports of post office activities.
- Choose, train, and evaluate the employees.
- Prepare work schedules.
- Try to solve labor disputes.

APTITUDES

- Be able to learn the practices and procedures of the postal service system.
- Have good verbal and numerical abilities.
- Be able to work with a variety of people.
- Be able to supervise others.
- Have ability to make decisions based on data and observation.
- Be able to keep accurate records.

WORK SETTING

Environment
    Work indoors in offices or postal work areas.
Hours
    Work 40 hours a week or more.
Employers
    Post Offices

CONSIDERATIONS

- The job may carry prestige.
- Postal workers are usually unionized.
- Usually this is not an entry-level position; most postmasters worked in lower-level positions and were promoted from within the system.

NEBRASKA EMPLOYMENT

About 747 postmasters and mail superintendents are projected to be employed by 1991.

WAGES

Postal workers with seniority may bid for the position of mail superintendent or postmaster. Salaries in Nebraska as well as nationally will vary according to the population and geographic size of the postal district. In Nebraska, entry level salaries range between $15,250 and $16,250. Nationally entry level salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- These positions are seldom filled from outside the postal service.
- Competition for entry-level positions is stiff.
- Automation is creating new supervisory positions in support and mail processing areas.

PREPARATION

SKILLS

- Knowledge of postal service operations and regulations.
- Skills in organizing and scheduling.

- Skills in report writing and recordkeeping.
- Skills in administration and supervision.
- Skills in working with a variety of people.
- Skills in negotiation and evaluation.

TRAINING

- Training is done on the job.
- To be hired as a postal employee, a person must be 18 years of age and pass written and physical exams.
- Some supervisory positions require one or two years of college training.
- Postmasters need to have seniority and to bid for a position.

EDUCATIONAL PROGRAM

145	Business Administration and Management
562	Public Administration
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, math, psychology, and government.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed, 1977), pp. 135 and 136.
Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.
Military Career Guide (1988-89 ed.), p. 258.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1351 FOOD SERVICE AND LODGING MANAGERS

OCCUPATIONAL DESCRIPTION

Food service and lodging managers have charge of businesses that serve foods and/or provide lodging and related services to people. This may include restaurants, hotels, school cafeterias, or similar facilities. They plan, organize, and direct the operation of the business.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Fast Food Services Managers (185.137-010)
Hotel and Motel Managers (187.117-038) (13511)
Food Service Directors (187.167-026)
Executive Housekeepers (187.167-046)
Camp Managers (187.167-066)
Convention Managers (187.167-078)
Food Service Managers (187.167-106) (13512)
Front Office Managers (187.167-110)
Liquor Establishment Managers (187.167-126)
Dietary Managers (187.167-026)
Lodging Facilities Managers (320.137-014)

NCIS RELATED OCCUPATIONS

1210	General Managers
3020	Dietitians
4643	Hotel Clerks
5212	Bartenders
5213	Waiters and Waitresses
5214	Cooks

WORK ACTIVITIES

- Coordinate the activities of workers who keep business records, pay accounts, and order supplies.
- Set standards for service, room rates, publicity, and food selection.
- Direct the preparation of food.
- Plan dining room, bar, and banquet operations.
- Direct maintenance of buildings and equipment.
- Enforce safety and cleanliness rules.
- Investigate and resolve complaints.
- Keep time and payroll records.
- Take inventories of supplies and equipment.
- Prepare and write reports.

APTITUDES

- Be able to learn the principles and procedures of managing a food service or lodging establishment.
- Have good verbal and numerical abilities.
- Be able to do a variety of activities in a limited period of time.
- Be able to relate to a variety of people and supervise others.
- Have ability to make decisions and plan and direct activities.
- Be able to react calmly in emergency situations.

WORK SETTING

Environment
Work indoors.
Hours
Work long, irregular hours including evenings, weekends, and holidays.
Employers
Hotels, motels, other lodging facilities, restaurants, bars, supper clubs, cafeterias, summer camps, resorts, hospitals, nursing homes, educational institutions, and self-employed.

CONSIDERATIONS

- Job sometimes carries prestige.
- Work may be stressful.
- Most of these positions are not entry-level, but rather require training and experience in lower-level positions.

NEBRASKA EMPLOYMENT

About 4,405 food service and lodging managers are projected to be employed by 1991.

WAGES

Salary levels vary according to the size and services provided by the facility, education, directly related experience and level of duties and responsibilities. After advancement from assistant manager, the average salary range for Nebraska is between $12,000 and $38,000. Nationally, salaries also vary widely due to differences in duties and responsibilities. Food and beverage managers average $42,000, whereas front office managers average $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Favorable
Factors

- The outlook is influenced by economic conditions, the size of personal incomes, and the amount of leisure time.
- Demand is greatest in population centers and recreational areas which attract business travelers and tourists.

PREPARATION

SKILLS

- Knowledge of management principles and related laws and regulations.
- Knowledge of accounting, purchasing, recordkeeping, and personnel administration.
- Skills in planning, organizing, and scheduling.
- Skills in public relations.
- Skills in dealing with a variety of people in a variety of situations.

TRAINING

- The minimum educational requirement is a high school diploma.
- Some employers hire applicants for entry-level positions and provide on-the-job training or management trainee programs to prepare the employee for management positions.
- Training in several specialty occupations may be obtained thorugh apprenticeship training.
- Larger businesses prefer employees with training from a two- to four-year college program in hotel, restaurant, or insitution management.
- Work experience is an important factor in determining promotions to these management positions.

EDUCATIONAL PROGRAM

145	Business Administration and Management
161	Hotel/Motel/Restaurant Management
393	Dietetics
399	Food Production, Management, and Services
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, speech, government, psychology, health, food, marketing, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 127, 129, and 130.
Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.
Occupational Outlook Handbook (1990-91 ed.), p. 56.

SCHOOLS

21801	Bellevue College
22316	Central Community College-G I
22501	Central Community College-Hastings
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11904	Ferris State College
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
11915	Rocky Mountain School of Meatcutting
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
44301	Spencer School of Business
21717	Union College
11932	University of Denver
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

13511 HOTEL OR MOTEL MANAGERS

OCCUPATIONAL DESCRIPTION

Hotel and motel managers are responsible for the efficient and profitable operation of hotels and motels. DOT 187.117-038

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Executive Housekeepers (187.167-046)
Convention Managers (187.167-078)
Front Office Managers (187.167-110)
Hotel Recreational Facilities Managers (187.167-122)

NCIS RELATED OCCUPATIONS

1210	General Managers
1351	Food Service and Lodging Managers
13512	Food Service Managers
1353	Property Managers
4643	Hotel Clerks
5242	Housekeeping Cleaners

WORK ACTIVITIES

- Hire and supervise personnel.
- Direct publicity.
- Buy or supervise the purchase of supplies.
- Determine room rates and credit policies.
- Plan budgets and expenditures.
- Plan conventions and conferences.
- Oversee dining room, bar, and banquet operations.
- May perform clerical work.
- May work as desk clerk or switchboard operator.
- May perform cleaning tasks and general building repairs.

APTITUDES

- Be able to learn management techniques and the operations of a hotel.
- Have very good verbal and numerical abilities.
- Be able to work with a variety of people and meet the public.
- Be able to do a variety of tasks using different skills.
- Be able to supervise others.
- Have ability to make decisions based on experience.
- Be able to work under pressure and handle emergencies.

WORK SETTING

Environment
    Work indoors.
Hours
    Work long, irregular hours; may include weekend, evening, and holiday hours.
Employers
    Hotels, motels, resorts, recreational area lodges, and self-employed.

CONSIDERATIONS

- This is usually not an entry-level position; hotels tend to promote employees of proven ability.
- Use of computers in hotel and motel management is becoming increasingly important.
- The job may be stressful.
- May be required to relocate.

NEBRASKA EMPLOYMENT

About 4,405 food service and lodging managers are projected to be employed by 1991. Hotel managers are included in this group.

WAGES

Salary levels vary widely according to the size and location of the facility. After promotion from assistant manager, managers in Nebraska may earn between $13,500 and $38,000 a year. Additional compensation in the form of lodging, meals, parking, laundry, and other services are common for managers. National salary averages are much higher ranging between $30,500 and $87,000 a year. The average salary for all hotel general managers nationally is $65,000 a year. Bonuses equal to twenty percent of the base salary are common in larger metropolitan and resort facilities.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable

National
Favorable

Factors

- The outlook depends on the economy and on expansion of the hotel, motel, and recreation industries.
- Demand is strongest in population centers and recreational areas which attract business travelers and tourists.

PREPARATION

SKILLS

- Knowledge of hotel/motel management as well as accounting, purchasing, and personnel administration.
- Skills in organizing and directing the work of others.
- Skills in decision making.
- Skills in public relations.
- Skills in dealing with a variety of people in a variety of situations.

TRAINING

- Employers in larger hotels and motels usually require managers to have completed a two- or four-year program in hotel and restaurant management.
- Some large operations have management training programs.
- Experience is very important; it may take anywhere from four to ten years of combined education and experience after high school to become a hotel manager.
- Previous work experience in a hotel or motel is helpful.

EDUCATIONAL PROGRAM

145	Business Administration and Management
161	Hotel/Motel/Restaurant Management
399	Food Production, Management, and Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, psychology, marketing, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 123, 129, and 130.

Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.

Occupational Outlook Handbook (1990-91 ed.), p. 38.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11904	Ferris State College
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
11915	Rocky Mountain School of Meatcutting
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
11932	University of Denver
21821	University of Nebraska at Omaha
217118	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

13512 FOOD SERVICE MANAGERS

OCCUPATIONAL DESCRIPTION

Food service managers coordinate food service activities of hotels, restaurants, or other establishments or at social functions. DOT 187.167-106

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Fast Food Service Managers (185.137-010)
Food Service Directors (187.167-026)
Military Food Service Managers (M13512)

NCIS RELATED OCCUPATIONS

1351	Food Service and Lodging Managers
13511	Hotel or Motel Managers
23902	Home Economists
3020	Dietitians
5214	Cooks

WORK ACTIVITIES

- Hire, train, and direct staff members.
- Draw up work schedules and set personnel policies.
- Supervise purchasing of supplies and equipment.
- Monitor costs and maintain inventories.
- Comply with laws and regulations.
- Assist with planning menus to make sure they meet nutritional and medical requirements.
- Supervise advertising or sales promotions.
- Handle complaints.
- Solve service or food quality problems.

APTITUDES

- Be able to learn management techniques and procedures and principles of food service.
- Have good verbal and numerical abilities.
- Be able to work with a variety of people and have a desire to serve them.
- Be able to perform a variety of tasks in a set time.
- Have ability to supervise others and accept responsibility.
- Be able to make decisions and keep records.
- Be able to handle emergencies calmly.

WORK SETTING

Environment
  Work indoors.
Hours
  Work long and irregular hours with weekends, evenings, and holidays possible.
Employers
  Hotels, motels, restaurants, hospitals, educational institutions, large businesses and industries, department stores, and self-employed.

CONSIDERATIONS

- Job sometimes carries prestige.
- Usually not an entry-level position; management jobs are often filled by people who start at other jobs and are hired because of their experience.
- Job may be stressful.

NEBRASKA EMPLOYMENT

About 4,405 food service and lodging managers are projected to be employed by 1991. Food service managers are included in this group.

WAGES

Salaries vary according to size of restaurant or food service facility, education, training and experience. In Nebraska, salaries range between $12,000 and $25,000 a year. Nebraska salaries compare favorably with national averages with a median base salary of $22,400 a year. Additional compensation in the form of bonuses and performance based incentive pay is common in the food service industry.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors
  - The outlook depends on economic conditions, growing personal incomes, added leisure time, and the number of women in the work force.
  - There is a growing demand for restaurant managers with college training to work for

large manufacturing plants, hospitals, schools, retirement homes, and hotels.

- Opportunities are most plentiful in large restaurant chains, especially for beginners.

PREPARATION

SKILLS

- Knowledge of management principles and the food preparation procedures used by the particular food service involved.
- Skills in accounting and supervising.
- Skills in public relations.
- Skills in decision making.
- Skills in planning, organizing, and scheduling.
- Knowledge of licensing requirements and sanitary regulations.

TRAINING

- The minimum educational requirement is a high school diploma.
- Some employers hire applicants for an entry-level position and through on-the-job training or management trainee programs prepare the employee for a management position.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Larger firms prefer employees with a degree from a two- or four-year college program in hotel, restaurant, or institution management.

EDUCATIONAL PROGRAM

145	Business Administration and Management
161	Hotel/Motel/Restaurant Management
393	Dietetics
399	Food Production, Management, and Services
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include speech, government, psychology, health, foods, marketing, accounting, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 120, 128, and 129.
Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.
Occupational Outlook Handbook (1990-91 ed.), p. 56.
Military Career Guide (1988-89 ed.), p. 254.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11904	Ferris State College
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
11915	Rocky Mountain School of Meatcutting
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
11932	University of Denver
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1352 RECREATION AND ENTERTAINMENT MANAGERS

OCCUPATIONAL DESCRIPTION

Recreation and entertainment managers oversee facilities that offer social, recreational, or cultural programs or activities. They review programs, prepare budgets, organize staff activities, order supplies and equipment, talk with promoters, and schedule leisure activities. They work in many areas of recreation such as athletics, arts and crafts, dance, or recreation for seniors and handicapped.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Pool Managers (153.137-010)
Recreation Establishment Managers (187.117-042)
Recreation Supervisors (187.137-010)
Dance Studio Managers (187.167-086)
Golf Club Managers (187.167-114)
Gun Club Managers (187.167-118)
Skating Rink Managers (187.167-146)
Theatre Managers (187.167-154)
Winter Sport Managers (187.167-166)
Bowling Alley Managers (187.167-222)
Recreation Facility Managers (187.167-230)
Camp Directors (195.167-018)

NCIS RELATED OCCUPATIONS

2033	Recreation Workers
3230	Musicians and Composers
32301	Instrumental Musicians
32302	Singers
3240	Actors and Directors
32401	Actors
32402	Television Directors
32403	Producers
32404	Program Directors
3401	Athletes and Related Workers
34011	Athletic Trainers
34012	Professional Athletes

WORK ACTIVITIES

- Plan, organize, and direct operation of the business.
- Set price and credit policies.
- Determine work procedures.
- Plan budgets and order needed supplies.
- Hire and fire employees and assign duties and schedules.
- Enforce safety and other regulations.
- Handle money affairs and keep business records.
- Deal with complaints.

APTITUDES

- Be able to learn recreation theory, programming, community organization, and management techniques.
- Have high ability with words and numbers.
- Be creative and imaginative.
- Have leadership qualities and be able to deal with a variety of people.
- Be able to coordinate and organize projects and handle detailed paperwork.

WORK SETTING

Environment

Work indoors in offices or recreation areas with some outdoor work possible.

Hours

Work 40 or more hours a week including evening, weekend, and holiday hours.

Employers

Government agencies, large private firms, youth agencies, hospitals, colleges and universities, retirement communities, rehabilitation facilities, state and national parks, vacation resorts, recreation and community centers, sports and enter-tainment centers, skating rinks, bowling alleys, and city government.

CONSIDERATIONS

- Job may require a person with athletic ability.
- Employee may have to deal with people who are hostile.

NEBRASKA EMPLOYMENT

About 8,802 are unclassified managers and administraters are projected to be employed by 1991. Recreational Entertainment Managers are part of this group.

WAGES

Assistant managers promoted to recreation and entertainment managers as well as new hires with experience may expect a starting salary range of between $16,500 and $28,000 a year in Nebraska. Salaries for season recreational facilities will be somewhat lower while salaries for managers of large performing arts and cinema complexes will be somewhat higher. National average salaries compare favorably with Nebraska. Much higher salaries may be expected at popular resorts and major metropolitan areas that traditionally support a more active and diverse performing arts community.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors

- Increased time available for leisure activities should add to the need for these workers.
- Longer life spans, earlier retirements, and more clubs for retired people increase job opportunities.
- Funding for recreation programs is uncertain and competition is strong for positions.

PREPARATION

SKILLS

- Knowledge of management principles and the operations, activities, and materials of the particular firm or agency where employed.
- Knowledge of health and safety regulations.
- Skills in supervising and handling a variety of people.
- Skills in planning, organizing, and recordkeeping.
- Skills in preparing and administering budgets and in raising money.

TRAINING

- Many employers prefer to hire managers with some college training in business management or recreation.
- Applicants with a bachelors degree will find better job opportunities.
- Experience in recreation and entertainment work is necessary before becoming a manager.
- Most employers provide on-the-job training for new or potential managers.

EDUCATIONAL PROGRAM

145	Business Administration & Management
235	Teacher Education, Specific Subject Area
564	Recreation

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, psychology, sociology, health, physical education, arts and crafts, drama, music, child care, marketing, accounting, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 126-127 and 129-130.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553 and 566-570.

SCHOOLS

21801	Bellevue College
22316	Central Community College-G I
22501	Central Community College-Hastings
22307	Central Community College-Platte
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1353 PROPERTY MANAGERS

OCCUPATIONAL DESCRIPTION

Property managers have charge of commercial, industrial, or residential properties for their owners. They provide a variety of services for their clients including preparing leases, collecting rents, arranging for the security and maintenance of the property, and collecting information. Much of their work may involve deciding which services should be provided and directing others to perform these tasks. They may advise their clients about purchasing or selling property.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Land Development Managers (186.117-042)
Leasing Managers (186.117-046)
Real-Estate Agents (186.117-058)
Public Events Facilities Rental Managers (186.117-062)
Apartment House Managers (186.167-018)
Housing Project Managers (186.167-030)
Land Leases-and-Rentals Managers (186.167-038)
Property Managers (186.167-046)
Condominium Managers (186.167-062)
Building Superintendents (187.167-190)

NCIS RELATED OCCUPATIONS

13511 Hotel and Motel Managers
4123 Real Estate Sales Agents

WORK ACTIVITIES

- Develop and prepare lease or rental agreements.
- See that properties are properly maintained.
- Administer financial activities.
- Arrange for insurance coverage on the properties.
- Gather information concerning the properties.
- Recommend changes in rental fees or policies.
- Advertise and show available rental space.
- Collect rents, check on problems, and maintain good public relations with tenants.
- Handle disputes and carry out legal processes for evictions.
- Keep financial records concerning property and pay mortgages, taxes, insurance premiums, and employees.

APTITUDES

- Be able to learn principles and procedures of real estate management.
- Have average verbal and math abilities.
- Be able to keep accurate records.
- Be able to deal with a variety of people in a variety of situations.
- Be able to handle a variety of activities.
- Be able to make decisions based on information and observation.

WORK SETTING

Environment
 Work indoors with occasional work outdoors.
Hours
 Work variable and irregular hours; may include weekend, evening, and holiday hours; some work may be part-time.
Employers
 Property owners, property management firms, real estate firms, large corporations, and self-employed.

CONSIDERATIONS

- Property managers are often paid by being permitted to live in a rental property rent free or at a reduced rate.
- Workers may have contact with hostile people and have to deal with complaints.
- Workers may be on call at all times.
- Pay may be low and some properties in undesirable locations.

NEBRASKA EMPLOYMENT

About 395 property managers are projected to be employed by 1991.

WAGES

Salaries of property and real estate managers vary according to location, size of property and level of responsibility. In Nebraska, starting salaries range between $15,000 and $25,000 a year. On-site apartment managers may start at the lower end of the scale but receive additional compensation in the form of housing and utilities. Commercial property managers may start at the upper end of the scale and receive additional compensation in the form of a company automobile or automobile allowance. National salary averages tend to be somewhat higher than Nebraska with a top range up to $30,000 a year. Corporate property and real estate managers may earn up to $75,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Growth in the number of rental properties being built should add to the need for these workers.
- Opportunities will be best in large metropolitan and industrial areas.
- Some openings result from low pay offered or because the property location is undesirable.

PREPARATION

SKILLS

- Knowledge of real estate management and property maintenance.
- Knowledge of laws relating to leasing and renting.
- Skills in accounting and recordkeeping.
- Skills in dealing with people.
- Skills in decision making.
- Skills in public relations and selling.

TRAINING

- The minimum educational requirement is usually a high school diploma.
- Most employers do not require college training, but college study in business administration may be helpful.
- Some form of on-the-job training may be given.

EDUCATIONAL PROGRAM

145	Business Administration & Management
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, government, marketing, accounting, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 123-125 and 131.
Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.
Occupational Outlook Handbook (1990-91 ed.), p. 51.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21506	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1359 SERVICE ORGANIZATIONS MANAGERS

OCCUPATIONAL DESCRIPTION

Service organization managers are in charge of businesses, departments, or organizations that provide customer or internal services. This may include laundry, burial security, repair, travel, or other services. They plan budgets, order stock and supplies, and determine work procedures and staff functions. They hire, train, and supervise staff. They keep business records, take inventories, and enforce safety and other rules. They also handle complaints and may promote the sale of services.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Volunteer Services Coordinators	(187.167-022)
Funeral Directors	(187.167-030)(13591)
Cemetery Managers	(187.167-074)
Dental Laboratory Managers	(187.167-090)
Travel Agency Managers	(187.167-158)
Laundry Superintendents	(187.167-194)
Animal Shelter Managers	(187.167-218)
Plant Protection Superintendents	(189.167-050)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers

WORK ACTIVITIES

- Direct a service department of a company that leases machinery.
- Organize the service offices and orders parts and supplies.
- Coordinate student and community volunteer services in organizations engaged in public, social, and welfare activities.
- Determine organization's needs, carry out recruitment and selection, and provide training.
- Direct cemetery program and coordinate activities of workers engaged in providing burial services and maintaining cemetery grounds.
- Oversee activities of workers in dental laboratory engaged in making and repairing dentures, crowns, inlays, and bridgework.
- Direct, coordinate, and participate in merchandising travel agency services.
- Manage laundry plant in linen supply business or commercial or industrial laundry.
- Supervise personnel involved in establishing, promoting, and maintaining a firm's security and property-protection programs.

APTITUDES

- Have ability to learn management techniques and procedures of specific area they work.
- Have good numerical and verbal abilities.
- Be able to work with a variety of people and supervise others.
- Have abilities to organize and direct activities.
- Be able to make decisions based on data and observations.

WORK SETTING

Environment

Work indoors; may include local travel.

Hours

Work 40 or more hours a week; may include some evening and weekend hours.

Employers

Laundries, cleaners, laundromats, cemeteries, travel agencies, dental laboratories, volunteer service organizations, social service agencies, nursing associations, implement and machinery businesses, security service companies, and any business or industry.

CONSIDERATIONS

- Job satisfaction may come from helping others.
- Many of these positions are not entry-level but rather are reached after several years of experience.

NEBRASKA EMPLOYMENT

About 3,016 Service Supervisors are projected to be employed by 1991. Service Organizations Managers are a part of this group.

WAGES

Starting salaries for service organization managers vary according to the size of the organization, level of responsibility and amount of demonstrated experience. Average starting salaries in Nebraska range between $15,000 and

$20,000 a year. National starting salaries are comparable with a slightly lower range of $12,000 to an equal $20,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors

- The number of job opportunities is influenced by the ups and downs of the economy.

PREPARATION

SKILLS

- Knowledge of the principles and procedures of the specific occupation involved with.
- Knowledge of management techniques.
- Skills in communication.
- Skills in recordkeeping.
- Skills in dealing with a variety of people and supervision.
- Skills in decision making and organizing and implementing training programs.

TRAINING

- The minimum educational requirement is usually a high school diploma.
- Some employers may require specialized or college training in the specific occupation.
- Most management positions require work experience in the related area.
- Some businesses offer on-the-job training or management trainee programs.

EDUCATIONAL PROGRAM

145	Business Administration & Management
149	Office Supervision & Management
159	Transportation and Travel Marketing
278	Vehicle and Mobile Equipment Mechanics
358	Dental Services
567	Criminal Justice
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, business, psychology, data processing, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 111 and 128-129.
Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
99301	Nebraska Law Enforcement Training Center
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
99816	Travel Careers Institute
21717	Union College
99827	Universal Technical Institute
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

13591 FUNERAL DIRECTORS

OCCUPATIONAL DESCRIPTION

Funeral directors are in charge of the preparation of bodies for burial and of arranging for funeral services. They are responsible for complete care of the deceased person from the time a call is received notifying them of the death until the funeral has been concluded. DOT 187.167-030

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

NCIS RELATED OCCUPATIONS

1359 Service Organizations Managers

WORK ACTIVITIES

- Obtain required information from families of the deceased.
- Provide needed assistance and counseling.
- Contact clergy specified by families.
- Assist in planning funeral details.
- File death certificates.
- Make cemetery arrangements.
- Pick up, embalm, and prepare body.
- Arrange caskets, lighting, and floral displays.
- Plan transportation for families and friends.
- Direct funeral procedures.
- Supervise final disposition of deceased.

APTITUDES

- Have ability to learn mortuary science and mortuary management.
- Be able to work with people in a time of great stress.
- Be able to communicate easily.
- Be able to make decisions based on facts and experience.
- Have ability to perform a variety of tasks.
- Be able to plan, organize, and coordinate activities.
- Be able to observe detail and slight differences and do precise work.
- Have good hand and finger dexterity.
- Have qualities of tact, sensitivity, and respect for others' wishes and belief

WORK SETTING

Environment
    Work indoors in funeral home and outdoors at cemetery.
Hours
    Work 40 or more hours a week including evenings and weekends; may be on call twenty-four hours a day.
Employers
    Funeral homes, state and county medical examiners, and self-employed.

CONSIDERATIONS

- Job may carry prestige especially in small towns.
- There may be satisfaction in providing help to people in time of grief.
- Those involved in embalming may be exposed to diseases.
- Job requires light lifting.

NEBRASKA EMPLOYMENT

About 287 funeral directors are projected to be employed by 1991.

WAGES

Entry level wages vary depending on factors such as location and size of community and size of firm. In Nebraska, starting wages for those who have completed training and are licensed range between $13,550 and $22,000 a year. Nationally, salaries parallel those of Nebraska. Additional compensation in the form of a clothing allowance is provided by most employers.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Unfavorable
Factors
- This occupation is experiencing very little growth, and there is very little turnover.
- The number of mortuary science graduates equals the number of jobs available.

PREPARATION

SKILLS

- Knowledge of business practices, funeral practices and law, and embalming.
- Knowledge of anatomy, pathology, bacteriology, physiology, and chemistry.
- Skills in counseling and communication.
- Skills in bookkeeping, planning, and organization.
- Skills in handling details.

LICENSING OR CERTIFICATION

- Funeral directors must be licensed by the Nebraska Board of Examiners in Embalming and Funeral Directing.
- To be licensed, an applicant must be of good moral character, have completed 60 semester hours in college, have full training from an accredited college of mortuary science, conduct no less than 25 funerals under supervision of a licensed funeral director and pass the exams.

TRAINING

- Two years of premortuary liberal arts training followed by a one-year program of study in a mortuary science school are required.
- A worker must serve an apprenticeship under a licensed director and assist in the direction of 25 funerals.

EDUCATIONAL PROGRAM

229	Funeral Services
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, anatomy, sociology, psychology, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 128.
Guide for Occupational Exploration (2nd ed., 1984), pp. 566-570.

SCHOOLS

21102	Chadron State College
21507	Doane College
21311	Kearney State College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
21622	Wayne State College

1370 ADMINISTRATIVE SERVICES MANAGERS

OCCUPATIONAL DESCRIPTION

Administrative services managers oversee the supportive services of a business, agency, or organization. Some direct activities concerned with the purchase or sale of materials or services. Others direct clerical functions, benefit programs, or repair and maintenance activities. They review reports and records and plan department activities. They assign duties to staff and prepare work schedules and budgets. They review operations, write reports, enforce rules, and help staff solve work problems. They also may deal with outside organizations on matters such as business services or contracts.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Contract Administrators (162.117-014)
Property-Disposal Officers (163.167-026)
Retirement Officers (166.267-030)
Office Managers (169.167-034)
Merit System Directors (188.117-086)
Property-Utilization Officers (188.117-122)
Department Managers (189.167-022)
Program Managers (189.167-030)
Military Data Processing Managers (M13700)

NCIS RELATED OCCUPATIONS

1101	Public Administrators
1210	General Managers

WORK ACTIVITIES

- Direct activities concerned with contracts for purchase or sale of equipment, materials, products, or services.
- Dispose of surplus property, other than real property, using knowledge of merchandising practices.
- Provide information and advice concerning provisions and regulations of government-administered retirement programs for public employees.
- Coordinate activities of clerical personnel in an organization.
- Direct administration of statewide merit system qualifying examinations.
- Coordinate property procurement and maintenance activities and negotiate property transfer and sales and leasing agreements.
- Direct departmental activities in a commercial, industrial, or service establishments.
- Manage programs to insure that prescribed activities are carried out in accordance with specific activities.

APTITUDES

- Be able to learn the procedures and principles of managing the specific business, agency, or organization.
- Have good verbal and math abilities.
- Be able to do accurate recordkeeping and handle detailed paperwork.
- Be able to handle a variety of tasks, organize operations and projects, and supervise people.
- Be able to make decisions based on data and observations.

WORK SETTING

Environment
    Work indoors in offices.
Hours
    Work 40 hours a week; may be occasional meetings outside regular work hours.
Employers
    Businesses, government agencies, health care facilities, manufacturing firms, utility companies, insurance companies, and colleges and universities.

CONSIDERATIONS

- These managers may rise through the ranks from a lower-level position within a firm.

NEBRASKA EMPLOYMENT

About 2,210 administrative services managers are projected to be employed by 1991.

WAGES

Starting salaries vary according to education and especially years of experience with the firm, organization, or agency. In Nebraska, salaries range between $15,000 and $40,000 a year. Salaries at the upper end of the range tend to be found in the military and government service.

Nationally, salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- Prospects are best for those applicants with experience.
- Positions in government agencies are dependent upon the amount of funding available.
- Job openings come primarily from replacement.

PREPARATION

SKILLS

- Knowledge of management practices and of the organization or business.
- Knowledge of computers and automated recordkeeping systems.
- Skills in recordkeeping and use of information.
- Skills in communication, supervision, and evaluation.
- Skills in decision making, planning, and scheduling.

TRAINING

- College or business school graduation is required for most jobs.
- Experience and familiarity with the organization are usually necessary.
- Most administrative services management positions are not entry-level positions.

EDUCATIONAL PROGRAM

145	Business Administration & Management
149	Office Supervision & Management
158	Secretarial Program

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, psychology, accounting, data processing, office education, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 94, 97, 100, 106, 133, 134, and 138.

Guide for Occupational Exploration (2nd ed., 1984), pp. 444-448 and 571-574.

Occupational Outlook Handbook (1990-91 ed.), p. 15.

Military Career Guide (1988-89 ed.), p. 250

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
44805	Word Processing and Secretarial College
22517	York College

1412 ACCOUNTANTS AND AUDITORS

OCCUPATIONAL DESCRIPTION

Accountants and auditors compile and analyze business records and prepare financial records used by management to make decisions. They design accounting systems and procedures and help managers in program management. They may prepare income tax forms or advise clients on certain business or financial decisions. Also, they may develop estate plans, accounting systems, or budgets. Some teach or do consulting. DOT 160.162-014, 160.167-010

HOLLAND CODE

CES (Conventional, Enterprising, Social)

SPECIALTIES

Tax Accountants (160.162-010)
Budget Accountants (160.167-014)
Cost Accountants (160.167-018)
County or City Auditors (160.167-030)
Internal Auditors (160.167-034)
Tax Auditors (160.167-038)
Bursars (160.167-042)
Military Accountants and Auditors (M14120)

NCIS RELATED OCCUPATIONS

1220	Financial Managers
1415	Loan Officers
1733	Statisticians
1739	Mathematicians
1912	Economists
4712	Bookkeepers and Accounting and Auditing Clerks

WORK ACTIVITIES

- Design and use accounting systems.
- Prepare balance sheets and profit/loss statements.
- May direct the work of others performing similar duties.
- Prepare various reports and documents such as payroll and sales tax reports, income tax returns, and personal property schedules.
- Examine and evaluate data relevant to the financial status of an organization.
- Make recommendations to management about improving operations and the financial position of the company.
- Prepare budgets and budgeting systems.
- Determine correctness or lack of compliance.

APTITUDES

- Be able to learn the complex system of bookkeeping used in business
- Have very good numerical and verbal abilities.
- Be able to work accurately with detail.
- Be able to work within set standards and time limits.
- Be able to plan and direct activities.
- Be able to make decisions based on experience and data.
- Have ability to work with a variety of people and supervise others.

WORK SETTING

Environment

Work indoors in offices and businesses; may require frequent travel.

Hours

Work 40 hours a week; longer hours are possible to meet deadlines.

Employers

Government agencies, private companies or institutions, accounting firms, industries, corporations, educational institutions, hospitals, banks, insurance companies, public utilities, and self-employed.

CONSIDERATIONS

- Job may bring satisfaction through helping improve businesses.
- Worker sits for long periods of time and may experience eyestrain from long hours of close work.

NEBRASKA EMPLOYMENT

About 6,864 accountants and auditors are projected to be employed by 1991.

WAGES

Starting salaries vary widely depending on education, experience, level of responsibility and the size of the firm, institution or agency. In Nebraska, entry level salaries for individuals with a bachelors degree and no experience range between $15,500 and $17,500 a year. Experenced accountants and auditors with a masters degree and who are either C.P.A. qualified or licensed to work as a C.P.A. may expect a beginning range of up to $33,000 a year. Starting salaries for both the public and private sector parellel closely however, advancement and increased income will be faster in the private sector. National averages are compatible with those of Nebraska with a slightly higher average base range of $17,000 to $19,500 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- The outlook depends on general economic conditions, complexity of tax laws, financial reporting requirements, and greater use of accounting services by businesses and public agencies.
- Competition is keen for entry-level positions.
- There is less competition for cost accounting and internal auditing jobs.
- Those with graduate degrees and/or experience will find the best opportunities.

PREPARATION

SKILLS

- Knowledge of accounting principles and methods, management procedures, computer science, and statistics.
- Skills in using adding machines, calculators, and other business machines.
- Skills in communication and public relations.
- Skills in understanding and interpreting laws.
- Skills in analyzing facts and information.

LICENSING OR CERTIFICATION

- Licensing is not required, but to work as a certified public accountant a person must be licensed by the State Board of Public Accountancy.
- The applicant must have a four-year degree in accounting, pass a CPA exam and ethics exam, and have two years of experience.
- For professional prestige, an auditor may become a Certified Internal Auditor by having a four-year degree, having two years of internal auditing experience, and passing an exam given by the Institute of Internal Auditors.

TRAINING

- The minimum educational requirement is a bachelor's degree in accounting or a closely related field.
- Some employers prefer advanced degrees.

EDUCATIONAL PROGRAM

143	Banking and Finance
145	Business Administration & Management
157	Accounting

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, economics, psychology, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 91-92.
Guide for Occupational Exploration (2nd ed., 1984), pp. 546-549.
Occupational Outlook Handbook (1990-91 ed.), p. 13.
Military Career Guide (1988-89 ed.), p. 247.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College

22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1414 UNDERWRITERS

OCCUPATIONAL DESCRIPTION

Underwriters review insurance applications to determine the degree of risk involved and accept or reject them. To make these decisions, they study information on insurance applications, medical reports, and actuarial studies. They may outline the terms of contracts or policies including the amounts of premiums. They often deal with clients, agents, and managers to obtain or give out information about policies. Most specialize in one of the three major categories of insurance: life, property and liability, or health. DOT 169.167-058

HOLLAND CODE

CSE (Conventional, Social, Enterprising)

NCIS RELATED OCCUPATIONS

1412	Accountants and Auditors
1732	Actuaries
1912	Economists
19121	Market-Research Analysts I
4122	Insurance Sales Agents
4782	Insurance Adjusters, Examiners, and Investigators

WORK ACTIVITIES

- Gather information from insurance applications, company records and policies, medical reports, and actuarial staff.
- Evaluate eligibility of applicants for specific types and amounts of insurance coverage.
- Outline terms of contract and compute amount of premium.
- Correspond with policy holders, agents, and managers to explain policy refusals or cancellations.

APTITUDES

- Be able to learn the principles and practices of insurance underwriting.
- Have high verbal and numerical abilities.
- Be able to work with detail and within set limits.
- Be able to evaluate information and make prompt decisions.
- Have ability to take responsibility and give directions to others.
- Be able to follow specific procedures.

WORK SETTING

Environment
  Work indoors in office settings; some travel may be required to visit sites or field representatives.
Hours
  Work 40 hours a week with possible overtime.
Employers
  Insurance companies, agents, and brokers.

CONSIDERATIONS

- Job may be satisfying for people who enjoy working with details and figures and evaluating information.
- Worker must sit and concentrate for long periods with little physical activity.

NEBRASKA EMPLOYMENT

About 1,066 underwriters are projected to be employed by 1991.

WAGES

Entry level salaries vary according to experience, certification, education and size of the agency. Personal line (noncommercial) underwriters tend to earn slightly less than commercial line underwriters. In Nebraska, entry salaries for all underwriters range between $18,000 and $30,000. Nationally, salaries are slightly lower reflecting the strength of the insurance industry in Nebraska with a range of $15,000 to $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors
  - Most openings will be replacement positions.
  - Insurance sales are expected to grow but at a slower rate then in the past.
  - Growing competition among insurance companies will add to the need for more underwriters.

PREPARATION

SKILLS

- Knowledge of statistics, insurance practices and laws, and computer science.
- Knowledge of the company's underwriting policies and types of insurance offered.
- Skills in complex computation.
- Skills in collecting and analyzing data.
- Skills in writing clear and accurate reports.
- Skills in public relations and getting along with others.

LICENSING OR CERTIFICATION

- Certification is not required, but for professional recognition a person may become a Certified Life Underwriter (CLU) or a Chartered Property Casualty Underwriter (CPCU).
- Requirements for both include field experience and passing an exam.

TRAINING

- Most employers seek college graduates with degrees in liberal arts or business administration.
- Underwriters learn their skills through on-the-job training.
- Continuing education is necessary for advancing to senior level positions.

EDUCATIONAL PROGRAM

143	Banking and Finance
145	Business Administration & Management
148	Insurance
448	Liberal Arts and Sciences
481	Mathematics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, accounting, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 106.
Guide for Occupational Exploration (2nd ed., 1984), pp. 546-549.
Occupational Outlook Handbook (1990-91 ed.), p. 58.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1415 LOAN OFFICERS

OCCUPATIONAL DESCRIPTION

Loan officers evaluate applicants' financial backgrounds and approve or disapprove loans to them. They review reports from credit analysts, interview the applicants, and may investigate business records to determine what the chances are that a loan will be repaid. DOT 186.267-018

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Loan Counselors (186.267-014)

NCIS RELATED OCCUPATIONS

1220	Financial Managers
1412	Accountants and Auditors
1912	Economists

WORK ACTIVITIES

- Review loan applications.
- Answer questions asked by applicants.
- Analyze applicant's financial status, credit, and property valuation.
- Approve or reject loans and refer applications to loan committee for final approval.
- Complete loan agreement for accepted loans.
- Study potential loan markets to develop loan prospects.
- Buy or sell contracts or real estate.
- Handle foreclosure proceedings.

APTITUDES

- Have ability to learn credit and finance procedures.
- Have good verbal and numerical abilities.
- Be able to work accurately with detail.
- Be able to work well with people.
- Be able to make decisions based on data, experience, and observations.

WORK SETTING

Environment

Work indoors in offices; may be required to travel to inspect property and visit potential borrowers.

Hours

Work 40 hours a week.

Employers

Banks; savings and loan associations; finance companies; personal, business, and agricultural credit institutions; and real estate firms.

CONSIDERATIONS

- Job may carry prestige.
- Loan officers spend much of day sitting at desks.
- Workers may deal with people who become angry when loan applications are rejected or loans are foreclosed.
- Loan officers often use computers to process information.

NEBRASKA EMPLOYMENT

About 913 loan officers are projected to be employed by 1991.

WAGES

Starting salaries for loan officers vary according to education, level of responsibility, and size of institution, form or business. Entry level salaries in Nebraska range between $16,000 and $24,000 a year. National averages compare favorably with Nebraska with a range up to $30,000.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Favorable

Factors

- The bank officer occupation as a whole is expected to grow faster than the average.
- There will be strong competition for any openings because of the increasing number of qualified candidates.
- The outlook depends on the interest rate charged for loans and economic conditions.

PREPARATION

SKILLS

- Knowledge of credit procedures and consumer credit and real estate laws.

- Knowledge of property and business appraisal techniques.
- Skills in communication and calculation.
- Skills in compiling and analyzing information.
- Skills in using computers to process information.
- Skills in decision making.

TRAINING

- Most employers prefer applicants with a bachelors degree.
- Some institutions hire people with two years of college and provide on-the-job training.
- Previous experience as a teller or credit representative is helpful.

EDUCATIONAL PROGRAM

116	Agricultural Business & Management
125	Agricultural Mechanics
143	Banking and Finance
145	Business Administration and Management

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, government, economics, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 126.
Guide for Occupational Exploration (2nd ed., 1984), pp. 546-549.
Occupational Outlook Handbook (1990-91 ed.), p. 30.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
44826	Teller Training Institute
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1420 MANAGEMENT ANALYSTS

OCCUPATIONAL DESCRIPTION

Management analysts study business operations to find ways to help management operate more efficiently and effectively. They conduct studies, design new work systems and procedures, look for ways to simplify work, and prepare procedures manuals. DOT 161.167-010

HOLLAND CODE

ESC (Enterprising, Social, Conventional

SPECIALTIES

Records-Management Analysts (161.267-022)
Military Management Analysts (M14200)

NCIS RELATED OCCUPATIONS

1712	Computer Systems Analysts
19121	Market-Research Analysts I

WORK ACTIVITIES

- Plan studies of work problems and procedures.
- Sketch office layouts to show location of equipment.
- Interview workers and managers.
- Conduct on-site studies of work performed and methods and equipment used.
- Recommend new systems or changes in existing procedures.
- Prepare written instructions for improvement.

APTITUDES

- Be able to learn about business operations and management procedures.
- Have above average use of numbers and words.
- Have average space and form perception.
- Be able to analyze data and work within set standards.
- Be able to make decisions based on data, observations, and experience.
- Be willing to accept responsibility for projects.
- Be able to work with a variety of people.
- Have ability to pay attention to detail.

WORK SETTING

Environment
  Work indoors in offices.
Hours
  Work 40 hours a week.
Employers
  Large businesses and organizations and government agencies.

CONSIDERATIONS

- Most openings will be in large metropolitan areas where large businesses and corporations are located.
- There may be pressure to meet project deadlines.

NEBRASKA EMPLOYMENT

About 350 management analysts are projected to be employed by 1991.

WAGES

Starting salaries in Nebraska range between $16,000 and $28,000 a year. Nationally, salaries tend to be somewhat higher with a range of $17,000 to $30,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
  - Some growth in the occupation is projected as large businesses and corporations work to operate more efficiently.

PREPARATION

SKILLS

- Knowledge of business operations and management procedures.
- Skills in planning, organizing, researching, estimating, and evaluating.
- Skills in explaining, describing, and classifying.

- Skills in reading and comprehending technical materials.

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- Skills in preparing oral and written reports.
- Skills in keeping records.
- Skills in supervising others.

TRAINING

- Most employers require applicants to have several years of experience in a related business occupation.
- Some companies promote experienced employees from within the company.
- Formal training at a business school, community college, or college and university is usually required.

EDUCATIONAL PROGRAM

145	Business Administration & Management
149	Office Supervision & Management

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in psychology, accounting, business law, and computer science

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 93-94.
Guide for Occupational Exploration (2nd ed., 1984), pp. 165-170.
Occupational Outlook Handbook (1990-91 ed.), p. 44.
Military Career Guide (1988-89 ed.), p. 256.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1430 PERSONNEL SPECIALISTS

OCCUPATIONAL DESCRIPTION

Personnel specialists make sure that workers and work activities are handled according to set procedures. They may interview and hire job applicants, counsel and discipline employees, and plan wage and salary rates. They write job descriptions and help department managers develop staffing patterns. They may also participate in or manage labor grievances, training and safety programs, and retirement and employee benefit programs. Some represent an organization in union negotiations or in labor disputes.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Directors of Placement (166.167-014)
Compensation Managers (166.167-022)
Labor Relations Managers (166.167-034)
Employment Interviewers (166.267-010)
Hospital-Insurance Representatives (166.267-014)
Job Analysts (166.267-018)
Recruiters (166.267-026)
Job Development Specialists (166.267-034)
Personnel Recruiters (166-267-038)
Human Resource Advisors (166.267-046)
Employment-and-Claims Aides (169.367-010)
Military Recruiting Specialists (M14301)
Military Recruiting Managers (M14300)

NCIS RELATED OCCUPATIONS

3320 Public Relations Specialists

WORK ACTIVITIES

- Hire and train employees.
- Manage pension, insurance, wage, and safety programs.
- Gather and examine data to help determine and set policies and practices.
- Discuss employment conditions and grievances with union representatives.
- Aid in the negotiation of union contracts.
- Coordinate and supervise the activities of their staff.
- Outline work conditions for prospective employees.
- May counsel employees with personal problems.

APTITUDES

- Be able to learn the practices of labor management.
- Have good verbal and math abilities.
- Be able to handle detailed paperwork.
- Be able to plan, organize, and coordinate activities.
- Be able to work well with people and influence them.
- Have ability to make decisions based on data and experience.
- Have qualities of leadership, emotional stability, tolerance, and patience.

WORK SETTING

Environment
Work indoors in offices, meeting rooms, and work areas.
Hours
Work 40 hours a week; longer hours may be required.
Employers
Employment agencies, labor organizations, manufacturers, government agencies, hospitals, educational institutions, utilities, department stores, insurance and investment companies, management consultants, business firms, and service organizations.

CONSIDERATIONS

- Job requires someone who is objective and has a good understanding of people.
- Workers may be under pressure to meet deadlines or solve employee conflicts.
- The use of computers in maintaining and analyzing personnel information is becoming common.

NEBRASKA EMPLOYMENT

About 1,465 personnel specialists are projected to be employed by 1991

WAGES

Starting wages for personnel specialists vary according to size of company and level of responsibilities. In Nebraska salaries range between $15,500 and $24,000 a year. Some major industries report salaries as high as $69,641. However, the median range for personnel specialists statewide is $26,000 a year. National averages compare favorably with Nebraska with a slightly higher range of $30,000 for entry level workers.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- Job outlook depends on the economy.
- Demand is best for experienced specialists, particularly those who have technical, industrial, or labor negotiation backgrounds.
- Opportunities for beginners for entry-level jobs are limited and competition is strong.

PREPARATION

SKILLS

- Knowledge of labor laws, government regulations regarding employment, management principles, and personnel issues.
- Knowledge of interview techniques, testing and evaluation procedures, and the company's operations.
- Skills in keeping personnel records and scheduling work hours.
- Skills in understanding human behavior.
- Skills in communication.

TRAINING

- The minimum educational requirement is a bachelor's degree.
- Many employers prefer applicants with a masters degree in labor economics, industrial relations, or personnel management.
- Law degrees with concentration in labor law or labor economics is helpful.
- Previous work experience in areas of personnel management such as employment interviewing, job analysis, or compensation analysis provides a useful background for this work.

EDUCATIONAL PROGRAM

141	Human Resources Development
145	Business Administration & Management
421	Law
541	Psychology
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, government, economics, sociology, psychology, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed. 1977), pp. 98, 99, and 107.

Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535 and 540-545.

Occupational Outlook Handbook (1990-91 ed.), p. 48.

Military Career Guide (1988-89 ed.), pp. 261 and 109.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus

44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1442 WHOLESALE AND RETAIL BUYERS

OCCUPATIONAL DESCRIPTION

Wholesale and retail buyers purchase goods for resale in wholesale and retail stores. They attend fashion and trade shows, visit showrooms, or talk with sales workers to select merchandise that will satisfy their stores' customers. A buyer for a small store may purchase its complete stock of goods. Those who work for larger businesses usually handle one or a few related lines of goods. Buyers must be able to judge the resale value of goods and make a purchase decision quickly. They also arrange for goods to be shipped and approve payments for orders received.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Buyers (162.157-018)
Assistant Buyers (162.157-022)

NCIS RELATED OCCUPATIONS

1250	Marketing and Advertising Managers
1443	Farm Products Purchasing Agents
1449	Purchasing Agents
19121	Market-Research Analysts I
4210	Sales Engineers
4230	Technical Sales Workers and Service Advisors
4240	Sales Representatives

WORK ACTIVITIES

- Choose and order goods for resale.
- Gather and analyze information concerning costs, prices, sales, and profits.
- Determine quantities to be purchased and price of purchases.
- Study research reports and sales records and determine which products are in demand.
- Arrange transportation of purchases.
- Negotiate contracts and authorize payments.
- Set prices and introduce new merchandise to staff members.

APTITUDES

- Be able to learn principles of merchandising and purchasing.
- Have good verbal and numerical abilities.
- Be able to work with a variety of details.
- Be able to perform a variety of tasks in a short period of time and to move often from one task to another using a variety of skills.
- Be able to make decisions based on data and experience.
- Have ability to work well with people and influence them.
- Be able to work under pressure and work for long hours.

WORK SETTING

Environment
Work indoors in offices, showrooms, and stores; travel is usually required.

Hours
Work 40 or more hours a week; seldom work a set number of hours; may work long hours during rush periods.

Employers
Hospitals; educational institutions, wholesale and retail trade companies; grocery and department stores; machinery, equipment, and supply firms; industrial firms; and government agencies.

CONSIDERATIONS

- Job may carry prestige.
- Some stores give workers discounts, bonuses, or sales incentives.
- Buyers meet many types of people and are often responsible for setting patterns of style.
- Buyers work long hours under stress, compete with others, and travel frequently.
- Computers are often used to help with tasks such as taking inventory, purchasing, record keeping, and budgeting.
- Many experienced buyers move into management positions.

NEBRASKA EMPLOYMENT

About 1,361 wholesale and retail buyers are projected to be employed by 1991.

WAGES

Beginning wages for wholesale and retail buyers vary according to the size of the business or institution, level of responsibilities for bidding, supervision of other buyers and technical expertise regarding compliance specifications for specific equipment. Starting salaries in Nebraska range between $15,000 and $27,000 a year in both the public and private sector. National salaries compare favorably with Nebraska with slightly higher ranges in geographic locations associated with a higher concentration of manufacturing and advanced technologies.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Somewhat Favorable
Factors

- Competition is very keen because merchandising attracts large numbers of college graduates.
- Centralized and joint buying may reduce the demand for buyers in retail establishments.
- For retail store buyers, more opportunities exist in large, metropolitan cities.
- Opportunities are better for persons with backgrounds in highly technical products.

PREPARATION

SKILLS

- Knowledge of purchasing and merchandising, contract laws, and market-research analysis.
- Knowledge of products purchased and current fashion trends, if applicable.
- Skills in communication and negotiation.
- Skills in working with people and influencing them.
- Skills in planning and decision making.
- Skills in using computers.

TRAINING

- Most employers from large companies prefer applicants with bachelors degrees in fashion merchandising, marketing, or business administration
- Some employers hire people with high school diplomas and sales work experience and train them through on-the-job training programs.
- Others prefer people with two or more years of college training in marketing or merchandising.

EDUCATIONAL PROGRAM

144	Apparel Marketing
145	Business Administration and Management
146	Marketing
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, economics, sociology, psychology, consumer education, marketing, accounting, data processing, business law, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 95.
Guide for Occupational Exploration (2nd ed., 1984), pp. 478-481.
Occupational Outlook Handbook (1990-91 ed.), p. 60.

SCHOOLS

21801	Bellevue College
44820	Career Institute of Omaha
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
44822	Dory Passolt Models
21810	Embry-Riddle Aeronautical University
21509	Hastings College
44823	International School of Modeling
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44824	Nancy Bounds International
44717	Nancy Bounds Modeling School and Agency-Lincoln
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College

22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1443 FARM PRODUCTS PURCHASING AGENTS

OCCUPATIONAL DESCRIPTION

Farm products purchasing agents buy products such as grain, produce, or livestock from farmers or cooperatives for processing or resale. They also may arrange for their shipment or storage.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Christmas-Tree Contractors (162.117-010)
Grain Broker-and-Market Operators (162.157-010)
Livestock Commission Agents (162.157-026)
Grain Buyers (162.167-010)

NCIS RELATED OCCUPATIONS

1442	Wholesale and Retail Buyers
1449	Purchasing Agents
5512	General Farmers
5514	Livestock Farmers
5515	Horticultural Farmers

WORK ACTIVITIES

- Analyze information about the product's use, quality, price, and availability.
- Calculate market value of the commodity.
- Bargain with other buyers and sellers for a fair market price.
- May trade in the commodity futures market.
- May manage a grain elevator or livestock yard.

APTITUDES

- Be able to learn the practices of agricultural commodities buying and selling.
- Have good numerical and verbal abilities.
- Be able to keep accurate records and see detail.
- Be able to handle a variety of activities.
- Be able to relate to people and influence them.
- Have ability to make judgments based on data, experience, and observations.
- Be able to work under pressur

WORK SETTING

Environment
  Work indoors and outdoors at sales, production, and storage areas; travel may be required.

Hours
  Work 40 or more hours a week; hours may be irregular due to weather and other seasonal factors.

Employers
  Grain elevators, grain companies, food processing and packing companies, large retailers and grocers, and self-employed.

CONSIDERATIONS

- Job may carry prestige especially in rural areas.
- Agriculture and related industries have been experiencing economic problems for some time.
- This normally is not an entry-level position.

NEBRASKA EMPLOYMENT

About 475 farm products purchasing agents are projected to be employed by 1991.

WAGES

Beginning wages vary according to level of responsibility, education and size and location of operation. Salaries parallel those of wholesale and retail buyers (NCIS 1442) with a range between $15,000 and $27,000 a year. National averages parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable

National
  Somewhat Favorable

Factors
  - Openings in this occupation are usually due to turnovers and promotions rather than growth.
  - Agricultural industry has been experiencing economic problems.
  - Demand is for well-qualified applicants.

PREPARATION

SKILLS

- Knowledge of commodities and their price characteristics and behavior.
- Knowledge of government regulations and the commodities futures market.
- Skills in communication and influencing others.
- Skills in information analysis and decision making.
- Skills in record keeping and buying and selling.

TRAINING

- The minimum educational requirement is a high school diploma plus experience in agriculture.
- Most employers prefer applicants with at least two years of college study in agriculture.
- Employers from large companies look for applicants with bachelors degrees.
- Previous work experience in agricultural markets such as grain elevators or involvement with judging teams in 4-H, FFA, or college is helpful.

EDUCATIONAL PROGRAM

111	Agricultural Production
116	Agricultural Business and Management
123	Plant Sciences
124	Agriculture Services
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in economics, government, vocational agriculture, agribusiness, marketing, accounting, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 94 and 95.
Guide for Occupational Exploration (2nd ed., 1984), pp. 478-481.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1449 PURCHASING AGENTS

OCCUPATIONAL DESCRIPTION

Purchasing agents buy supplies and raw materials for internal use or for further processing at manufacturing firms. They review processing at manufacturing firms. They review requests for materials and supplies, collect information on the sources and prices of goods, and contact suppliers to arrange purchase contracts. They may also negotiate for purchase of services and arrange financing or other assistance. They advise suppliers concerning the type, quality, and amounts of materials needed in the future. They keep records and write reports.

HOLLAND CODE

ESC (Enterprising, Social, Conventional)

SPECIALTIES

Contract Specialists (162.117-018)
Field Contractors (162.117.022)
Field-Contact Technicians (162.117-026)
Outside Property Agents (162.157-030)
Procurement Engineers (162.157-034)
Purchasing Agents (162.157-038)
Purchase-Price Analysts (162.167-030)
Contracts Managers (163.117-010)
Military Purchasing and Contracting Managers (M14490)

NCIS RELATED OCCUPATIONS

1442	Wholesale and Retail Buyers
1443	Farm Products Purchasing Agents
4210	Sales Engineers
4230	Technical Sales Workers and Service Advisors
4240	Sales Representatives

WORK ACTIVITIES

- Review requisitions.
- Contact suppliers to get information about products, prices, or delivery dates.
- Choose items for purchase.
- Prepare specifications for bids.
- Review bid proposals.
- Make contracts for purchasing goods or services.
- Keep records concerning items purchased costs, delivery, and inventories.
- Meet with other personnel concerning supplies and needs.
- Study market conditions and price trends.
- May control storage and issuance of supplies.

APTITUDES

- Be able to learn the principles and methods of purchasing.
- Have good verbal and math abilities.
- Be able to handle detailed paperwork.
- Have ability to relate to people and influence them.
- Be able to plan and direct projects.
- Be able to make decisions based on data and experience.
- Be able to negotiate.

WORK SETTING

Environment
  Work indoors in offices; some travel may be necessary.
Hours
  Work 40 hours or more a week.
Employers
  Manufacturing firms, construction companies, hospitals, colleges and universities, business firms, and government agencies.

CONSIDERATIONS

- Purchasing agents frequently work under pressure in making sure supplies are ordered on time, delivery dates are met, product specifications are satisfied, and payments are made.

NEBRASKA EMPLOYMENT

About 3,178 purchasing agents are projected to be employed by 1991.

WAGES

Beginning salaries for purchasing agents vary widely due primarily to location within the state. The eastern metropolitan area reports a beginning salary range of between a minimum of $13,851 and $28,680 to a maximum range of between $28,325 and $43,020. The balance of the state reports a range of between $15,500 and $24,000. Factors other than geographic location include education, size of employer and public and private sector status of employer. National averages compare favorably with greater Nebraska statistics with a range of between $17,000 and $30,000.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors

- New jobs could result from the emphasis on cost controls and tighter profit margins.
- More positions should open in service-producing organizations such as hospitals and schools as they realize the need to cut costs through purchasing agents.
- Most job openings will result from the need to replace purchasing agents who leave their jobs.

PREPARATION

SKILLS

- Knowledge of purchasing procedures and company operations.
- Knowledge of sources of supplies, pricing methods and discounts, and inventory control.
- Skills in negotiating prices and contracts.
- Skills in planning and decision making.

LICENSING OR CERTIFICATION

- Licensing is not required but to gain professional recognition in private industry, a person may become a Certified Purchasing Manager.
- To be certified, a person must pass four exams given by the National Association of Purchasing Management and meet education and experience requirements.
- To gain professional recognition in government, a person may become a Professional Public Buyer or a Certified Public Purchasing Officer.
- To become certified, a person must pass an exam given by the National Institute of Governmental Purchasing, Inc., and meet education and experience requirements.

TRAINING

- Most large organizations require applicants with a bachelors degree and some prefer those with a masters degree for this position.
- Some small companies hire people with associate degrees in purchasing or promote clerical or technical workers into this position.
- Employers usually provide on-the-job training.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Industry experience is important.
- Classes in technical subjects related to the company or field in which the applicant will work is helpful.

EDUCATIONAL PROGRAM

145	Business Administration & Management
146	Marketing
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including classes in composition, speech, economics, manufacturing, marketing, accounting, data processing, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 94-96.
Guide for Occupational Exploration (2nd ed., 1984), pp. 540-545.
Occupational Outlook Handbook (1990-91 ed.), p. 54.
Military Career Guide (1988-89 ed), p. 259.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College

44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1472 CONSTRUCTION INSPECTORS

OCCUPATIONAL DESCRIPTION

Construction inspectors make sure that the methods and materials used to build and repair structures comply with regulations. They inspect structures such as highways, streets, sewer systems, dams, bridges, and buildings. They visit work sites to observe and test parts of structures. They keep work logs, file work reports, and, if necessary, issue stopwork orders. Most of the workers specialize in a certain type of construction work such as building, electrical, or plumbing. DOT 182.267-010

HOLLAND CODE

RIC (Realistic, Investigative, Conventional)

SPECIALTIES

Building Inspectors (168.167-030)
Electrical Inspectors (168.167-034)
Elevator Inspectors (168.167-038)
Heating and Refrigeration Inspectors (168.167-046)
Plumbing Inspectors (168.167-050)
Grade Checkers (850.467-010)
Testers (899.487-010)

NCIS RELATED OCCUPATIONS

1330	Construction Managers
1473	Inspectors and Compliance Officers
6422	Carpenters

WORK ACTIVITIES

- Gather and examine data such as blueprints, building plans, and zoning laws.
- Determine whether or not all aspects of the building meet building codes and ordinances.
- Check all phases of construction.
- Investigate reported incidents of work being done on a building without required permits.
- Direct violators to comply with regulations.
- Prepare reports concerning violations and inspection.

APTITUDES

- Be able to learn principles of construction, inspection, and codes.
- Have good verbal and numerical abilities.
- Have good space and form perception and eye-hand coordination.
- Have ability to work with people even in situations of conflict.
- Be able to make decisions based on data and to work with little room for error.
- Be able to visualize objects from pictures and drawings.

WORK SETTING

Environment
Work indoors in offices and buildings being constructed and outdoors at construction sites; often requires travel.
Hours
Work 40 hours or more a week.
Employers
Federal, state, and local governments and insurance companies.

CONSIDERATIONS

- Work is usually steady and year-round.
- Workers may have to climb atop high buildings or into narrow crawl spaces which may involve risk of bodily injury.
- May work in noisy and wet surroundings or be exposed to hazardous chemicals.
- This is normally not an entry-level job.

NEBRASKA EMPLOYMENT

About 189 construction inspectors are projected to be employed by 1991.

WAGES

Graduates of four year construction management programs may expect a salary range of between $18,000 and $21,000 as an entry level wage in Nebraska. National averages are quite favorable with those of Nebraska with a slightly higher top range of $24,000.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Unfavorable

Factors

- The number of new jobs for inspectors will be affected by the level of construction activity.
- The actual number of job openings will vary from year to year with ups and downs in the economy.
- People with some college education and construction experience in one of the crafts will have the best job opportunities.
- The outlook is very favorable, but this is a small occupational group.

PREPARATION

SKILLS

- Knowledge of construction practices, materials, and laws.
- Skills in observation and data collection.
- Skills in problem solving and decision making.
- Skills in communication and report writing.

TRAINING

- Many employers prefer inspectors to complete an apprecticeship program, two years of college study toward a degree in engineering or architecture, or a two-year technical degree in construction technology.
- All employers require several years of experience in construction.

EDUCATIONAL PROGRAM

131	Architecture and Environmental Design
253	Engineering Technologies
288	Construction Trades
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, speech, geometry, government, construction, industrial arts, drafting, and electrical/electronics.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 101, 110, 850, and 875.
Guide for Occupational Exploration (2nd ed., 1984), pp. 176-184.
Occupational Outlook Handbook (1990-90 ed.), p. 21.

SCHOOLS

22501	Central Community College-Hastings Campus
21102	Chadron State College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

1473 INSPECTORS AND COMPLIANCE OFFICERS

OCCUPATIONAL DESCRIPTION

Inspectors and compliance officers conduct investigations to see if laws, regulations, or company policies are being followed. Some check to see that proper equipment is being used and that safety rules are being obeyed. Some inspect places such as hospitals and restaurants to enforce public health laws. Some compile information on the activities and conduct of workers. Others inspect articles being carried into the county to enforce customs laws.

HOLLAND CODE

ERS (Enterprising, Realistic, Social)

SPECIALTIES

Chief Bank Examiners (160.167-046)
Coroners (168.161-010)
Industrial-Safety-and-Health Technicians (168.161-014)
Equal-Opportunity Representatives (168.167-014)
Boiler Inspectors (168.167-026)
Health Care Facilities Inspectors (168.167-042)
Occupational-Safety-and-Health Inspectors (168.167-062)
Safety Inspector (168.264-014)
Gas Inspectors (168.264-018)
Claim Examiners (168.267-014)
Customs Inspectors (168.267-022)
Driver's License Examiners (168.267-034)
Food and Drug Inspectors (168.267-042)
Motor Vehicle Inspectors (168.267-058)
Agricultural Chemicals Inspectors (168.267-082)
Water-Pollution Control Inspectors (168.267-090)
Sanitation Inspectors (168.267-110)
Equal Opportunity Officers (168.267-114)
Agricultural Commodities Inspectors (168.287-010)
Code Inspectors (168.367-018)
Energy-Conservation Representatives (959.367-018)
Military Environmental Health Specialists (M14731)
Military Environmental Health Officers (M14730)

NCIS RELATED OCCUPATIONS

1472	Construction Inspectors
2701	Veterinarians
3690	Health Technologists and Technicians
36904	Sanitarians

WORK ACTIVITIES

- Inspect equipment, establishments, or products to see that they meet health, safety, or quality regulations.
- Collect samples for laboratory analysis.
- Watch people for compliance to codes or regulations.
- Test products, environments, and clients to determine compliance.
- Collect evidence of violations.
- Write reports of findings.
- Make recommendations for corrections.
- Present evidence in legal proceedings.

APTITUDES

- Be able to learn the standards and regulations and inspection procedures for the specific area employed in.
- Have good numerical and verbal abilities.
- Be able to make decisions based on data and observations and work with very little room for error.
- Be able to see slight differences in objects and make exact measurements and timings.
- Be able to relate to people.
- Have ability to handle a variety of activities and pay attention to detail.

WORK SETTING

Environment

Work indoors or outdoors in various work sites; frequent travel may be required.

Hours

Work 40 or more hours a week; hours may be long and irregular and include evenings and weekends.

Employers

Federal, state, and local governments; large manufacturing firms; and insurance companies.

CONSIDERATIONS

- Job offers satisfaction from improving health, quality, and safety conditions.
- Worker may be subject to noise, fumes, and other hazards.

NEBRASKA EMPLOYMENT

About 1,103 compliance officers and inspectors are projected to be employed by 1991.

WAGES

Starting salaries for inspectors and compliance officers vary widely depending on level of responsibility, education and size of the company or agency. Nebraska salaries range between $18,000 and $22,000 in both the public and private sector. Federal inspectors and compliance officers tend to start at higher salaries than do those at the state or private level, especially aviation and postal inspectors. Federal salaries are determined by the individual branch of the government for which they work and nature of inspection or compliance activity.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Unfavorable
Factors
- Most job openings will be replacement positions.
- The outlook depends on public concern about potential health and safety hazards and on the trend to cut government spending.

PREPARATION

SKILLS

- Knowledge of standards and regulations and inspection procedures for a specific industry.
- Knowledge of federal, state, and local health and safety regulations.
- Skills in oral and written communication.
- Skills in investigative and data gathering techniques.
- Skills in decision making.

TRAINING

- Requirements vary according to the specific type of safety inspector.
- Some require specialized training or two years of college training in safety and health.
- Some require a bachelors degree in a related science.
- Most require work experience in a related area.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Some specific positions require that an applicant pass a written exam.

EDUCATIONAL PROGRAM

111	Agricultural Production
112	Animal Sciences
114	Food Sciences
251	Engineering
253	Engineering Technologies
372	Pharmacy
378	Veterinary Medicine
399	Food Production, Management and Services
524	Chemistry
531	Life Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, biology, chemistry, physics, government, health, manufacturing, and consumer education.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 92, 100, 101, 103, and 104.

Guide for Occupational Information (2nd ed. 1984), pp. 176-184 and 561-565.

Occupational Outlook Handbook (1990-91 ed.), p. 41.

Military Career Guide (1988-89 ed.), pp. 83 and 286.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11904	Ferris State College

21509	Hastings College
11959	Hawkeye Institute of Technology
11907	Iowa State University
11908	Kansas State University
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
11915	Rocky Mountain School of Meatcutting
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
11922	University of Missouri-Columbia
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1610 ARCHITECTS

OCCUPATIONAL DESCRIPTION

Architects plan, design, and supervise the construction of buildings, other structures, parks, airports, highways, and other projects. They are involved in all phases of the development of a project. They give their clients information about building costs and materials, prepare drawings and specifications, and visit the building sites to check that plans are being followed. Some supervise construction projects. DOT 001.061-010

HOLLAND CODE

AIE (Artistic, Investigative, Enterprising)

SPECIALTIES

School-Plant Consultants (001.167-010)
Landscape Architects (001.061-018) (16101)

NCIS RELATED OCCUPATIONS

1330	Construction Managers
1628	Civil Engineers
1920	Urban and Regional Planners
3220	Designers
32203	Interior Designers
3720	Drafters

WORK ACTIVITIES

- Design projects that are attractive, safe, and useful.
- Discuss project with client and prepare drawings based on client's needs.
- Specify building dimensions and materials.
- Supervise administration of construction contracts, visit construction sites, and inspect construction to make sure it meets requirements and codes.
- May specialize in residential or nonresidential buildings, historic preservation, energy design, or health care structures or do research.

APTITUDES

- Be able to learn and understand the principles of architecture.
- Have ability to communicate ideas to clients and assistants and do technical writing.
- Have very good math ability.
- Have ability to visualize objects from sketches and blueprints and to see slight differences in objects and drawings.
- Be able to make detailed drawings and models.
- Have a good sense of color and texture.
- Be interested in using data, scientific facts, and creative thinking.
- Be able to make decisions based on experience.

WORK SETTING

Environment
    Work indoors in an office with some visits to construction sites.

Hours
    Work 40 hours a week with some work on evenings and weekends.

Employers
    Architectural firms, industrial firms, builders, real estate developers, government agencies, and self-employed.

CONSIDERATIONS

- Work is often independent, permits person to be creative, and involves responsibilities.
- Workers may be able to find work in related fields during economic downturns.
- Jobs may include pressure from clients.

NEBRASKA EMPLOYMENT

About 1,884 architects are projected to be employed by 1991.

WAGES

Registered professional architects in Nebraska may expect an entry salary range of between $24,000 and $35,000 a year depending on the size of the firm and level of responsibility. Salaries may be substantially lower for individuals who choose to work independent of a firm. These individuals may find difficulty in getting established in their own practices and may go through a period when their expenses are greater than their income. National averages compare favorably with Nebraska. Income ranges for architects working for the federal governament will be somewhat higher than those in the private sector.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors
- Employment is expected to rise, but the number of degrees granted in architecture is also growing causing competition for the available jobs.
- Demand for architects depends upon the ups and downs in the economy and construction activity.

PREPARATION

SKILLS

- Knowledge of construction methods and architectural design.
- Skills in planning, designing, drawing and drafting, and basic engineering.
- Knowledge of business and management and building codes.
- Skills in art and problem-solving.
- Skills in technical writing for documenting projects.
- Verbal skills to explain ideas and listening skills to understand the client's needs.
- Skills with computer-aided design is helpful.

LICENSING OR CERTIFICATION

- In Nebraska a person must complete eight years of combined education and work and pass an exam on the fundamentals and practice of architecture.
- The exam is given by the Nebraska State Board of Examiners for Professional Engineers and Architects.

TRAINING

- Employers require applicants with a five-year bachelors degree or a six-year masters degree in architecture from a school with an approved program.
- Architects work at least three years as an architect-in-training before taking the exam to qualify for registration as a professional architect.
- Graduate training is needed to teach or do research.

EDUCATIONAL PROGRAM

131	Architecture and Environmental Design
132	City, Community, and Regional Planning

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, history, economics, physics, art, construction, commercial and graphic art, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 15.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 71.

SCHOOLS

21102	Chadron State College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22708	Southeast Community College-Beatrice Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln

16101 LANDSCAPE ARCHITECTS

OCCUPATIONAL DESCRIPTIONS

Landscape architects plan and design development of land areas for projects such as parks, airports, highways, commercial developments, public works projects, land subdivisions, and residential sites. They study the site; draw up plans; make sketches, models, and drawings; and supervise resulting work. DOT 001.061-018

HOLLAND CODE

AIR (Artistic, Investigative, Realistic)

NCIS RELATED OCCUPATIONS

1330	Construction Managers
1610	Architects
1628	Civil Engineers
1920	Urban and Regional Planners
3220	Designers
32206	Floral Designers
3720	Drafters

WORK ACTIVITIES

- Meet with clients, engineers, and architects to discuss project.
- Gather and study data on site conditions such as location and soil features.
- Prepare site plans, working drawings, specifications, and cost estimates for land development.
- Coordinate arrangement of proposed and existing land features and structures.
- Inspect construction work in progress to make sure plans are followed, approve quality of materials, and advise client and construction workers on landscape features.

APTITUDES

- Be able to learn the principals of landscape architecture.
- Be able to communicate ideas to clients and assistants and do technical writing.
- Have ability to visualize objects from sketches and blueprints.
- Be able to handle detailed paperwork, do detailed drawings, and make models.
- Be able to direct projects and coordinate activities.
- Be able to make decisions based on visual observation and experience and interpret client's needs.

WORK SETTING

Environment
Work indoors in offices and outdoors at the site being developed.

Hours
Work 40 hours a week but may work longer hours to meet deadlines.

Employers
Architectural, landscaping, and engineering firms; government agencies involved in areas of forest management, city planning, urban renewal, highways, parks, and recreation; landscape nurseries; and self-employed.

CONSIDERATIONS

- Workers may specialize in parks and playgrounds, hotels and resorts, shopping centers, public housing, or regional planning.
- Workers should have creativity and sensitivity to beauty and good technical skills.
- Landscape architects often work as members of a design team.

NEBRASKA EMPLOYMENT

Fewer than 30 landscape architects are projected to be employed by 1991.

WAGES

In Nebraska, graduates with a bachelors degree in landscape architecture usually start at about $20,000 a year; those with a masters degree start between $25,000 and $35,000 a year. Those entering federal government as a landscape architect may expect slightly higher salary ranges depending on college records and location. National salary ranges in the private sector tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
Favorable

National
Favorable
Factors

- Jobs in this field are expected to increase because of expected growth in city and regional planning and construction in general.
- Actual number of openings may vary with the ups and downs in the economy and construction activity.
- The outlook is favorable, but this is a small occupational group.

PREPARATION

SKILLS

- Knowledge of landscape design, horticulture, and construction.
- Skills in surveying, drafting, planning, designing, and drawing.
- Knowledge of business and management and building codes.
- Skills in art and problem-solving.
- Skills in technical writing to document projects, in verbal communications to explain ideas, and in listening to understand the client's needs.
- Skills in computer-aided design is helpful.

LICENSING AND CERTIFICATION

- Registration is required to practice landscape architecture.
- Registration includes completing a degree from an accredited program in landscape architecture, completing four years of work experience under a registered landscape architect, and passing an exam.

TRAINING

- The educational requirement is four- to five-year bachelors degree in landscape architecture from a program accredited by the American Society of Landscape Architects.
- Apprenticeship training lasting several years under a licensed landscape architect may sometimes be substituted for college training.
- Many states require landscape architects to be licensed. Admission to the Uniform National Examination requires a degree plus 1-4 years of work expereience.

EDUCATIONAL PROGRAMS

115	Horticulture
131	Architecture and Environmental Design
132	City, Community, and Regional Planning
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in earth science, biology, vocational agriculture, industrial arts, construction, commercial and graphic art, drafting, and computer science

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 15.

Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.

Occupational Outlook Handbook (1990-91 ed.), p. 72.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
22708	Southeast Community College-Beatrice Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln

1622 AEROSPACE ENGINEERS

OCCUPATIONAL DESCRIPTION

Aerospace engineers design, develop, test, and help produce aircraft, missiles, and spacecraft. They work to improve the technology in aviation, defense systems, and space travel. Most specialize in a particular area of work such as structural design, guidance and control, or production methods. They also may specialize in one type of aerospace product such as commercial aircraft, helicopters, or rockets.

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Aerodynamicists (002.061-010)
Aeronautical Engineers (002.061-014)
Aeronautical Test Engineers (002.061-018)
Aeronautical-Design Engineers (002.061-022)
Aeronautical-Research Engineers (002.061-026)
Stress Analysts (002.061-030)
Cost-Analysis Engineers (002.167-010)
Field-Service Engineers (002.167-014)
Military Aerospace Engineers (M16220)

NCIS RELATED OCCUPATIONS

1623	Metallurgical and Materials Engineers
1626	Chemical Engineers
1633	Electrical and Electronic Engineers
1635	Mechanical Engineers
1733	Statisticians
1739	Mathematical Scientists
1843	Physicists

WORK ACTIVITIES

- Gather information concerning such things as proulision structures or guidance or control.
- Design and develop commercial, military, executive, or special purpose aircraft; space vehicles, satellites or missiles; or other related vehicles.
- Test models, subassemblies, or production vehicles to evaluate operation during actual or simulated flight conditions.
- Specialize in design and development of components of structures such as wings, landing gear, or control systems.
- Plan and oversee projects.

APTITUDES

- Have ability to learn principles of aeronautical design, complex math, and aeronautical technology.
- Have verbal and math abilities to use in research, design, development activities, and technical documentation.
- Be able to visualize objects from pictures and written matter and to see slight differences in objects and drawings.
- Be able to handle a variety of tasks, coordinate projects, and keep records.
- Be able to make decisions based on data and judgment.
- Be able to work within exact standards.

WORK SETTING

Environment
Work indoors in laboratories and offices and outdoors at construction, testing, and launching sites.
Hours
Work 40 hours a week.
Employers
Manufacturers of aircraft, missile, and spacecraft vehicles; commercial airlines; government agencies; private research organizations; private consulting firms; and communications equipment manufacturers.

CONSIDERATIONS

- Employment of aerospace engineers is concentrated in states with large aerospace industries such as California and Washington.
- Creativity is important in this field.
- Workers often specialize in areas such as structural design or specialize in one type of aeronautical product such as rockets.

NEBRASKA EMPLOYMENT

About 26 aerospace engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with bachelors degrees are significantly higher than starting salaries of college graduates in other fields. Starting offers for those with a bachelors degree vary by the particular branch of engineering. The average entry level salary for aerospace engineers is approximately $30,000. California, Washington, and Texas, states with large aerospace manufacturers, have the most aerospace engineers. In Nebraska, starting salaries range between $17,264 and $25,376 a year. Nationally, starting salaries range between $23,500 and $35,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- An increase in federal spending for defense and aerospace systems should add to the need for more workers in this field.
- The need for quieter, more efficient commercial airlines and more helicopters for business traffic will also increase job openings.
- This is a very small occupational group in Nebraska.

PREPARATION

SKILLS

- Knowledge of basic sciences, complex math, aeronautics, and engineering principals.
- Skills in research, design and drafting, and communication.
- Skills in art and problem-solving.

TRAINING

- A bachelors degree is the minimum educational requirement.
- A graduate degree is required for most research, teaching, and administrative positions.
- After college, continuing education is usually necessary.

EDUCATIONAL PROGRAMS

251 Engineering

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses such as advanced math, chemistry, physics, manufacturing, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 16.
Occupational Outlook Handbook (1990-91 ed.), p. 64.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Military Career Guide (1988-89 ed.), p. 295.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1623 METALLURGICAL AND MATERIALS ENGINEERS

OCCUPATIONAL DESCRIPTION

Metallurgical and materials engineers try to find new or improved ways to extract metal from ores. They try to develop new products and new uses for these products as well as methods of producing them. Also, they design tools and equipment used to make products from materials such as clay, glass, stone, and metal. DOT 019.061-014

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Ceramic Design Engineers (006.061-010)
Ceramic Engineers (006.061-014)
Ceramic Research Engineers (006.061-018)
Ceramics Test Engineers (006.061-022)
Foundry Metallurgists (011.061-010)
Metallographers (011.061-014)
Extractive Metallurgists (011.061-018)
Physical Metallurgists (011.061-022)
Welding Engineers (011.061-026)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1624	Mining Engineers
1625	Petroleum Engineers
1626	Chemical Engineers
1627	Nuclear Engineers
1634	Industrial Engineers
1635	Mechanical Engineers
1843	Physicists
1845	Chemists
1847	Geologists

WORK ACTIVITIES

- Conduct testing and studies of materials to determine their physical characteristics and qualities.
- Find combinations of materials that will improve the quality of products.
- Develop new processes to obtain the desired qualities of products and to develop new products.
- Make sure manufacturing standards are met.
- Coordinate testing of finished products.
- Direct and improve the methods used to remove metals from ores.
- Evaluate technical and economic factors to decide which materials are best for each product or application.

APTITUDES

- Be able to learn complex math, science, and engineering principles.
- Have strong verbal and math abilities.
- Have good perception of space and form relationships and color and good eye- hand coordination and finger dexterity.
- Be able to handle a variety of activities, direct and organize projects, and coordinate testing processes.
- Be able to make decisions based on data and work within precise measurements and set standards.

WORK SETTING

Environment
  Work indoors in offices, laboratories, and production areas.
Hours
  Work 40 hours a week.
Employers
  Industries concerned with steel or iron, electrical equipment, machinery, aircraft, mining, or stone, clay, or glass products; colleges and universities; government agencies; consulting firms.

CONSIDERATIONS

- Workers usually specialize in one branch of production.
- Workers may need to reach for things, see well, and do light lifting.
- Workers may be exposed to hazards, but safety standards help prevent injury.

NEBRASKA EMPLOYMENT

About 43 metallurgical and materials engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields.

Starting offers for those with a bachelors degree vary according to the particular branch of engineering. Nationally the average entry level salary for metallurgical, ceramic, and materials engineers is approximately $31,000 a year. In Nebraska the average starting salary range is $17,250 to $26,200 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- More of these engineers will be needed to develop new materials and products or to adapt them to new uses.
- Programs related to nuclear energy, defense, electronics, medical science, and energy resource development will provide job opportunities.

PREPARATION

SKILLS

- Knowledge of basic sciences, complex math, and engineering principles.
- Skills in research, design, and use of laboratory equipment.
- Ability to write technical reports.

TRAINING

- Minimum educational requirement is a bachelors degree.
- A graduate degree is necessary for most research and university teaching positions.
- Part-time work during college in a plant producing ceramic or metal products is helpful.

EDUCATIONAL PROGRAMS

251	Engineering
521	Physical Sciences
524	Chemistry
529	Physics
533	Science Technologies

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, chemistry, physics, manufacturing, metalworking, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 21, 27, and 35.

Occupational Outlook Handbook (1990-91 ed.), p. 68.

Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11958	Florida Institute of Technology
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11954	University of Hawaii at Manoa
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1624 MINING ENGINEERS

OCCUPATIONAL DESCRIPTION

Mining engineers develop, evaluate, extract, and prepare minerals for processing, refining, and manufacturing. They also conduct research, inspect mining areas, plan ways to mine deposits, direct work at mines and quarries, train miners, and write reports. Some spend much of their time at mine sites supervising mining operations; others do research in offices or labs. DOT 010.061-014

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Mining-and-Oilfield Equipment Design Engineers (010.061-010)
Mining-and-Oil Well Equipment Research Engineers (010.061-022)
Mines Safety Engineers (010.061-026)
Mining-and-Oilfield Equipment Test Engineers (010.061-030)

NCIS RELATED OCCUPATIONS

1623	Metallurgists and Materials Engineers
1625	Petroleum Engineers
1626	Chemical Engineers
1628	Civil Engineers
1643	Land Surveyors
1847	Geologists

WORK ACTIVITIES

- Conduct geological exploration to determine location, size, availability, and estimated value of a deposit.
- Decide the cheapest and most effective method of extraction.
- Plan location and development of shafts, tunnels, and chambers.
- Plan methods and locations for storing and replacing dug soil.
- Lay out and direct construction and operation of access roads, water and power supplies, drainage, ventilation, and transportation systems.
- Plan and coordinate use of people and equipment.
- Plan height and placement of digging levels and type and capacity of digging equipment.

APTITUDES

- Be able to learn complex math, sciences, and mining engineering principles.
- Have good verbal and math abilities.
- Have good space and form perception, general coordination, and record keeping abilities.
- Be able to handle a variety of activities and direct projects.
- Be able to make decisions based on data and work within precise measurements and set standards.
- Be able to work with others.

WORK SETTING

Environment
  Work both indoors in offices, laboratories, and production areas and outdoors at mining sites.
Hours
  Work 40 hours a week but longer hours may be required to complete projects on schedule.
Employers
  Mining companies, government agencies, consulting firms, manufacturers of mining equipment, and educational institutions.

CONSIDERATIONS

- These engineers may work closely with others to complete a project.
- Workers may be exposed to hazards connected with the mining process and may work in wet, dark areas.
- These engineers are often required to remain in remote areas for long periods of time.
- Mining activity has shifted to third world and other overseas countries.

NEBRASKA EMPLOYMENT

About eight mining engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields. Starting offers for those with a bachelors degree vary according to the particular branch of engineering the individual is entering. The average entry level salary for mining engineers is $28,950 a year nationally. In Nebraska, starting salaries range between $21,250 and $36,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Unfavorable
Factors

- Mining industry experienced a slump during the early 1980's.
- Growing energy needs will add to the demand for these workers.
- Recovery of metals from the sea and development of oil-shale deposits could open up new jobs.
- Increasing enforcement of safety regulations will also increase demand.

PREPARATION

SKILLS

- Knowledge of geology, complex math, mining processes, and engineering principles.
- Skills in planning, supervising, and coordinating exploration and mining activities.
- Skills in problem solving and communication.

LICENSING AND CERTIFICATION

- Registration is available but not usually required.
- To qualify for registration as a mining engineer, a person must complete four to five years of approved education in engineering, complete four to five years of work experience, and pass an exam given by the State Board of Examiners for Professional Engineers and Architects.
- After completing college, an exam may be taken to be certified as an engineer-in-training.

TRAINING

- A bachelors degree in mining engineering or a closely related field is the minimum educational requirement.
- A graduate degree is necessary for most research and university teaching positions.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Summer work in a job related to mining would be helpful.

EDUCATIONAL PROGRAMS

251	Engineering
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, chemistry, physics, geography, manufacturing, energy and power systems, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 24-25.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 68.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1625 PETROLEUM ENGINEERS

OCCUPATIONAL DESCRIPTIONS

Petroleum engineers plan, organize, and supervise the way oil and natural gas are obtained, stored, and shipped. They also do research, give technical advice, and direct workers who drill and operate oil wells. Some spend much of their time at oil fields. Others work mostly in offices or labs. DOT 010.061-018

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Mud-Analysis Well Logging Captains (010.131-010)
Research Chief Engineers (010.161-010)
Chief Petroleum Engineers (010.161-014)
Seismic Prospecting Observers (010.161-018)
Chief Engineers (010.167-010)
Mud-Analysis Well Logging District Supervisors (010.167-014)
Oil-Well Services Superintendents (010.167-018)

NCIS RELATED OCCUPATIONS

1623	Metallurgists and Materials Engineers
1624	Mining Engineers
1626	Chemical Engineers
1628	Civil Engineers
1633	Electrical and Electronic Engineers
1635	Mechanical Engineers
1643	Land Surveyors
1847	Geologists

WORK ACTIVITIES

- Gather and evaluate geological maps of subsurface oil and gas reservoir locations.
- Recommend placement of wells.
- Evaluate production rates during oil production phases.
- Develop well-drilling plans and well-completion processes for management approval.
- Give technical consultation during drilling.
- Inspect wells, monitor production, develop efficient production methods, and test equipment.
- May be involved in research, management, or application of petroleum engineering principles to solving environmental problems.

APTITUDES

- Be able to understand basics of oil exploration and production, use of numbers, and visualize space and form relationships.
- Have ability to communicate with a variety of people, read and understand technical materials, and write reports and plans.
- Be able to handle detailed paperwork and make decisions based on data.
- Be able to take responsibility for direction of a project and work accurately with precise factors.
- Have manual and finger dexterity, average physical coordination, and planning ability.

WORK SETTING

Employment

Work indoors in offices or outdoors making visits to oil fields or gas storage locations.

Hours

Work 40 to 50 hours a week or more, depending on the amount of time spent in field work.

Employers

Major oil companies, smaller oil exploration and production companies, utility companies, public agencies, manufacturers of drilling equipment and supplies, banks and financial institutions, consulting firms, educational institutions, and self-employed, mostly located in Texas, Oklahoma, Louisiana, California, and Colorado.

CONSIDERATIONS

- A person may work outdoors in all kinds of weather and be subjected to high levels of noise.
- Job may involve physical activity and require great responsibility with potential for loss of life or property if mistakes are made.
- New graduates often spend 50 to 75 percent of working hours in field work before advancing to management positions.
- Job offers potential for creativity, independent work, and problem solving.

NEBRASKA EMPLOYMENT

About 20 petroleum engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields. Nationally, starting salaries for petroleum engineers are at the top of the scale for all engineers with an average beginning wage of $35,000 a year. Entry level annual wages in Nebraska range between $20,000 and $25,000.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Somewhat Favorable
Factors

- The need to develop new sources of oil will contribute to growing demand for petroleum engineers.
- The shift of mining to third world and other overseas countries will increase job opportunities abroad.

PREPARATION

SKILLS

- Knowledge of engineering and design principles.
- Knowledge of higher level math and computer technology applications.
- Understanding of oil exploration, production methods, and drilling and completion equipment.
- Ability to develop production plans.
- Ability to communicate in speaking and writing and to do precise work.
- Willingness to make decisions.

LICENSING AND CERTIFICATION

- Registration is available but usually not required.
- Registration as a petroleum engineer requires completing four to five years of approved education, completing four to five years of work experience, and passing an exam given by the State Board of Examiners for Professional Engineers and Architects.
- An examination may be taken after completing college to become an engineer-in- training.

TRAINING

- A bachelors degree in engineering is the minimum educational requirement.
- Graduate training in engineering is preferred by some employers especially for positions in research and universities.
- Summer employment in oil-field production work is helpful.

EDUCATIONAL PROGRAMS

251 Engineering

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, chemistry, physics, geography, manufacturing, energy and power systems, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 25-26.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 69.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1626 CHEMICAL ENGINEERS

OCCUPATIONAL DESCRIPTION

Chemical engineers design and develop processes and equipment for manufacturing and refining chemicals and related products. They help design, build, and operate plants that use or process chemicals. Some specialize in certain areas such as pollution control or heat transfer or in the production of certain types of products such as plastics or drugs. Some teach or do research. DOT 008.061-018

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Chemical Processes Design Engineers (008.061-014)
Chemical Research Engineers (008.061-022)
Chemical Test Engineers (008.061-026)
Chemical Plant Technical Directors (008.167-010)
Absorption and Adsorption Engineers (008.061-010)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1623	Metallurgical and Materials Engineers
1624	Mining Engineers
1625	Petroleum Engineers
1635	Mechanical Engineers
1845	Chemists

WORK ACTIVITIES

- Design processes and equipment for the manufacture of chemicals, rubber, plastics, and other consumer products.
- Supervise workers who conduct, control, and improve chemical manufacturing processes.
- Do research to develop new or improved chemical manufacturing processes and products.
- Design equipment for movement, storage, and packing of solids, liquids, and gases.
- Gather and analyze scientific data pertaining to chemicals.
- Apply principles of chemical engineering to solve environmental or bio-medical problems.
- May specialize in oxidation, pollution control, energy resources, energy conversion, or medical drugs.

APTITUDES

- Have ability to learn principles of engineering and chemistry.
- Be able to read and write technical materials and explain procedures to workers.
- Be able to use a variety of skills in work.
- Be able to plan and direct a project, make judgments based on experience and data, and work according to set standards.
- Have ability to see details and check accuracy.

WORK SETTING

Environment
Work both indoors and outdoors.
Hours
Work 40 hours a week with longer hours possible to meet deadlines.
Employers
Oil and gas production and processing companies, chemical manufacturing industries, government agencies, consulting firms, educational institutions, and self-employed.

CONSIDERATIONS

- Engineer is responsible for injury or damage resulting from design error.
- Work is done under pressure.
- Duties cut across many fields; therefore, they must have knowledge of chemistry, physics, and mechanical and electrical engineering.

NEBRASKA EMPLOYMENT

About 194 chemical engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields. Chemical engineers rank second highest on a national scale of starting salaries for all engineers. The average beginning wage for all chemical engineers is $31,250. In Nebraska, as well as nationally, starting salaries range between $27,500 and $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors
- Increasing needs in environmental control and energy production have created a larger demand for chemical engineers.
- More specialization in the engineering field has created more job opportunities.

PREPARATION

SKILLS

- Knowledge of principles of design, chemistry, math, and engineering.
- Skills in supervision, computer technology, communication, and use of chemical laboratory equipment.
- Ability to write technical reports and explain technical processes.
- Willingness to experiment.

LICENSING AND CERTIFICATION

- Registration is available but not usually required.
- To qualify for registration as a chemical engineer, a person must complete four to five years of approved education in engineering, complete four to five years of work experience, and pass an exam given by the State Board of Examiners for Professional Engineers and Architects.
- After completing college, an exam may be taken to become a certified engineer-in-training.

TRAINING

- A bachelors degree in chemical engineering is the minimum educational requirement.
- A graduate degree is required for research and university teaching positions.
- Part-time work in a chemical plant during college is helpful.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAMS

251	Engineering
524	Chemistry
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, chemistry, physics, energy and power systems, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 24.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-170.
Occupational Outlook Handbook (1990-91 ed.), p. 65.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1627 NUCLEAR ENGINEERS

OCCUPATIONAL DESCRIPTION

Nuclear engineers study the development and uses of atomic power. They conduct research into problems of nuclear energy systems, design and develop nuclear equipment, and monitor testing, operation, and maintenance of nuclear reactors. DOT 015.061-014

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Nuclear Equipment Design Engineers (015.061-010)
Nuclear Equipment Research Engineers (015.061-018)
Nuclear Equipment Test Engineers (015.061-022)
Military Nuclear Engineers (M16270)

NCIS RELATED OCCUPATIONS

1623	Metallurgical and Materials Engineers
1628	Civil Engineers
1633	Electrical and Electronics Engineers
1634	Industrial Engineers
1635	Mechanical Engineers
1843	Physicists

WORK ACTIVITIES

- Plan and conduct nuclear research.
- Evaluate findings to develop new concepts and new uses of radioactive processes.
- Plan, design, and develop nuclear equipment.
- Monitor the testing, operation, and maintenance of nuclear reactors.
- Develop safe methods of nuclear waste products disposal.
- Prepare technical reports.

APTITUDES

- Be able to learn complex math, physics, and principles of nuclear engineering.
- Have strong verbal abilities for use in reading, writing, and conducting research and design work.
- Have a good space and form perception.
- Be able to coordinate and organize projects.
- Be able to make decisions based on data and work within precise limits and set standards.
- Be able to explain technical matters.

WORK SETTING

Environment
Work indoors in offices, laboratories, and nuclear plants.
Hours
Work 40 hours a week.
Employers
Public and private utility companies, research laboratories, hospitals, government agencies, manufacturing firms, consulting firms, and educational institutions.

CONSIDERATIONS

- Workers are exposed to hazards connected with radioactive materials, but safety practices usually prevent accidents.
- Workers must have security clearance from federal government when working on classified projects.
- These engineers often work as a member of a team.

NEBRASKA EMPLOYMENT

About 15 nuclear engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields. Starting offers vary with the engineering specialty. Nuclear engineers may expect an average starting wage of $30,000. This average starting wage for all nuclear engineers is the same for Nebraska and nationally. Starting salaries span a range between $25,000 and $35,000 a year in Nebraska, $26,450 and $50,000 a year nationally.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable

National
Unfavorable
Factors

- The need for nuclear engineers is affected by government regulations and the state of the economy.
- New applications of nuclear power in medicine, defense, and energy should open new jobs.
- This is a very small occupational group in Nebraska.

PREPARATION

SKILLS

- Knowledge of complex math, science, and nuclear engineering principles.
- Knowledge of government regulations and safety practices relating to use of nuclear power.
- Skills in research, design, and problem solving.
- Skills in communication and supervision.

LICENSING AND CERTIFICATION

- Nuclear engineers must become registered by completing four years of engineering study and passing a written exam.
- Workers who operate nuclear reactor controls of commercial plants must be licensed by the Nuclear Regulatory Commission by passing operating, written, and medical exams.

TRAINING

- A bachelors degree in nuclear engineering or other closely-related engineering major is the minimum educational requirement.
- Advanced graduate degrees may be necessary since nuclear engineering is often taught at the graduate level.

EDUCATIONAL PROGRAMS

251 Engineering

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including composition, advanced math, biology, chemistry, physics, energy and power systems, drafting, government, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 31-32.

Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.

Occupational Outlook Handbook (1990-91 ed.), p. 69.

Military Career Guide (1988-89 ed.), p. 308.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1628 CIVIL ENGINEERS

OCCUPATIONAL DESCRIPTION

Civil engineers plan, design, and supervise the construction of structures such as buildings, roads, water and sewage systems, bridges, and dams. They may study building sites, draw layouts, make models, and discuss alternatives with clients. They may also estimate costs, prepare reports on bidding and construction documents, and inspect sites during construction. Attending public hearings and other meetings is often part of the job. They may also do such things as conduct research, advise on engineering problems, and teach. DOT 005.061-014

HOLLAND CODE

IRS (Investigative, Realistic, Social)

SPECIALTIES

Airport Engineers (005.061-010)
Hydraulic Engineers (005.061-018)
Irrigation Engineers (005.061-022)
Railroad Engineers (005.061-026)
Sanitary Engineers (005.061-030)
Structural Engineers (005.061-034)
Transportation Engineers (005.061-038)
Military Civil Engineers (M16280)

NCIS RELATED OCCUAPTIONS

1330	Construction Managers
1610	Architects
16101	Landscape Architects
1624	Mining Engineers
1625	Petroleum Engineers
1627	Nuclear Engineers
1635	Mechanical Engineers
1643	Land Surveyors

WORK ACTIVITIES

- Design and direct the construction of structures.
- Meet with clients concerning plans.
- Supervise the maintenance of structures and facilities.
- May teach or supervise engineering programs.
- May do technical research using computers.
- May work as a member of an urban planning team.
- May test the strength and reliability of the parts of a structure.
- May specialize in highway, water resources, environmental, structural, construction, or public works engineering.

APTITUDES

- Have ability to learn principles of engineering.
- Be able to communicate technical information in speaking and writing.
- Be able to visualize objects from pictures, drawings, and descriptions and to see slight differences in objects and drawings.
- Be able to understand abstract concepts and solve problems.
- Have ability to make decisions based on exact measurements and set standards.
- Be able to take responsibility for planning and directing a project and to work as a part of a team.

WORK SETTING

Environment
Work indoors in offices, laboratories, or factories and outdoors at construction sites.

Hours
Work 40 to 45 hours a week with longer hours possible to complete a project.

Employers
Construction companies, educational institutions, government agencies, consulting firms, public utilities, railroads, manufacturing firms, heavy industries, and self-employed.

CONSIDERATIONS

- Work involves logical thinking and problem solving.
- Job may require extensive travel or frequent transfers.
- Job allows independent work and creativity.
- Work requires some physical activity.

NEBRASKA EMPLOYMENT

About 1,779 civil engineers are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for civil engineers with a bachelors degree and/or an Engineer in Training (EIT) certificate range between $26,600 and $30,400 a year. National salary ranges compare favorably with Nebraska. Somewhat higher entry level salaries may be found in the Southwest region of the United States as well as in major metropolitan areas on either coast. Civil engineers employed by the federal government may also expect a somewhat higher starting salary range.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- A growing population will result in a need for more civil engineers.
- More jobs will open with the need to repair and replace existing structures.
- Economic ups and downs influence construction and job opportunities for civil engineers.

PREPARATION

SKILLS

- Knowledge of engineering principles, design, math, and computer technology.
- Understanding of building materials, methods, and codes.
- Skills in technical writing, planning, and supervision.
- Ability to make decisions, take responsibility, and work on a team.

LICENSING AND CERTIFICATION

- Registration is available but usually not required except in some public interest areas.
- To be registered as a civil engineer, a person must complete four to five years of approved education in engineering, have three or four years of work experience, and pass an exam given by the State Board of Examiners for Professional Engineers and Architects.
- After completing college, a person may take an exam to be certified as an engineer-in-training.

TRAINING

- A bachelors degree in engineering from an accredited program is required.
- Some employers require a graduate degree.
- Part-time employment in a related job is helpful.

EDUCATIONAL PROGRAMS

251 Engineering

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, government, construction, drafting, computer science, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp 20-21.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 65.
Military Career Guide (1988-89 ed.), p. 249.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1632 AGRICULTURAL ENGINEERS

OCCUPATIONAL DESCRIPTION

Agricultural engineers work to solve farming problems and to find ways to make farms run better and produce more. They design farm machines, structures, and equipment that will improve the production, processing, and delivery of farm products. Some plan and supervise the production of such items. Others help to conserve and manage energy, soil, and water resources. DOT 013.061-010

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Agricultural-Research Engineers (013.061.014)
Agricultural Equipment Design Engineers (013.061-018)
Agricultural Equipment Test Engineers (013.061-022)

NCIS RELATED OCCUPATIONS

1852	Forestry and Soil Conservation Scientists
1853	Agricultural and Food Scientists
18531	Agronomists
18532	Soil Scientists
18533	Food Technologists
1854	Biological Scientists
18543	Botonists
18545	Plant Pathologists
18522	Soil Conservationists
23903	County-Agricultural Agents

WORK ACTIVITIES

- Design and direct the manufacture or construction of equipment, structures, or facilities.
- Develop standards for manufacture and construction.
- Make detailed studies and conduct experiments and tests on production, processes, and products.
- Plan and direct construction of rural electrical power, irrigation, drainage, and flood control.
- Manage farm production and processing systems.

APTITUDES

- Be able to learn complex math, agricultural sciences, and agricultural engineering principles.
- Have strong verbal and math abilities.
- Have good space and form perception, general coordination, finger and hand dexterity, and color perception.
- Be able to handle a variety of activities, plan and direct projects, and communicate with people.
- Be able to make decisions based on data and work within set standards.

WORK SETTING

Environment

Work indoors in offices, laboratories, and production areas and outdoors at construction or testing sites.

Hours

Work 40 hours a week.

Employers

Farm equipment manufacturers, utility companies, soil and water management agencies, educational institutions, agricultural processing plants, consulting firms, government agencies, commercial farms and ranches, and self-employed.

CONSIDERATIONS

- Work may involve some physical activity and exposure to wet or noisy conditions.
- This job offers many different areas of application including research and development, production, sales, or management.

NEBRASKA EMPLOYMENT

About 71 agricultural engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries for college graduates in other fields. Agricultural engineers with a bachelors degree in Nebraska may expect an entry salary range of between $28,500 and $40,000 a year depending on the size of the agency, firm or institution. National salary ranges compare favorably with Nebraska with a somewhat higher top range of up to $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Somewhat Favorable
Factors
- Growing demand for agricultural products and emphasis on conservation should increase the need for these workers.
- Improvement of farming operations and new uses for farm products should open new opportunities.
- A growing number of agricultural engineers are needed in foreign countries.

PREPARATION

SKILLS

- Knowledge of agriculture, math, and agricultural engineering.
- Skills in research, design, and problem solving.
- Skills in speaking, writing, and supervising.
- Ability to interpret data to make decisions.
- Ability to work on a team.

LICENSING AND CERTIFICATION

- Registration is available, but usually not required. To qualify for registration as an agricultural engineer, a person must complete four to five years of approved education in engineering, complete four to five years work experience and pass an exam given by the State Board of Examiners for Professional Engineers and Architects.
- After completing college, an exam may be taken to become a certified engineer-in-training.

TRAINING

- A bachelors degree in agricultural engineering is the minimum educational requirement.
- A graduate degree is necessary for many research and most university teaching positions.
- Work experience in agriculture is helpful.

EDUCATIONAL PROGRAMS

124	Agricultural Services
251	Engineering

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, government, geography, manufacturing, vocational agriculture, agribusiness, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 30-31.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1633 ELECTRICAL AND ELECTRONIC ENGINEERS

OCCUPATIONAL DESCRIPTIONS

Electrical and electronic engineers design and supervise the manufacturing of electrical and electronic equipment, systems, and machinery. Some design and operate power plants, and others teach or do research. They also may test equipment, solve operating problems, and write performance standards. Electrical equipment includes power generators and transmitters, electric motors, and lighting and wiring. Electronic equipment includes radar, computers, televisions, and stereo sets. DOT 003.061-010, 003.061-030

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Electrical Test Engineers (003.061-014)
Electrical-Design Engineers (003.061-018)
Electrical-Research Engineers(003.061-026)
Electronics-Design Engineers (003.061-034)
Electronics-Research Engineers (003.061-038)
Electronics-Test Engineers (003.061-042)
Power System Electrical Engineers (003.167-018)
Transmitter Engineers-In-Charge (003.167-034)
Power-Distribution Engineers (003.167-046)
Military Electrical and Electronics Engineers (M16330)
Military Computer Systems Engineers (M16331)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1625	Petroleum Engineers
1627	Nuclear Engineers
1635	Mechanical Engineers

WORK ACTIVITIES

- Design new products and explain their uses.
- Supervise the production of electrical and electronic equipment.
- Test equipment and solve operating problems.
- Develop new ways to use the electrical qualities of various materials.
- Estimate time and cost of engineering projects.
- Direct operation and maintenance activities of electrical and electronic installations.
- Evaluate systems.
- Write technical reports.
- May specialize in an electronic or electrical field.

APTITUDES

- Have ability to learn science, math, and basic principles of electrical and electronics engineering.
- Be able to write and communicate technical materials.
- Be able to visualize space and form relations to create designs.
- Be able to do jobs requiring a variety of skills, direct and organize activities, and solve technical problems.
- Be able to make decisions based on visual observation, measurable data, and set standards.

WORK SETTING

Environment

Work indoors in offices or laboratories or sometimes outdoors on construction sites.

Hours

Work 40 to 45 hours a week with longer hours possible to complete a project.

Employers

Manufacturing companies, communication and power utilities, government agencies, oil companies, electronic instrument companies, educational institutions, consulting firms, and self-employed.

CONSIDERATIONS

- Work involves logical thinking, problem solving, and precision.
- Job may offer opportunity for creativity.
- Job involves responsibility for designing safe products.

NEBRASKA EMPLOYMENT

About 1,701 electrical and electronics engineers are projected to be employed by 1991.

WAGES

Entry level salaries for electrical and electronic engineers with a bachelors degree range between $32,000 and $45,000 a year in Nebraska. Nationally, electrical and electronic engineers are the largest branch of engineering with an average salary range comparable to Nebraska salaries. The size and location of the firm, agency or institution as well as the grade point average of the recent graduate will determine the entry wage.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- Growing demand for improved computer technology, communication equipment, and new types of power generation add to the need for these engineers.
- Increased concern for conservation, environmental protection, and alternate energy development also adds to the demand.

PREPARATION

SKILLS

- Knowledge of electronics, electrical theory, engineering principles, design, and higher level math.
- Skills in technical writing and problem solving.
- Knowledge of computer technology, microprocessing technology, instrumentation, or communications component technology.

LICENSING AND CERTIFICATION

- All 50 states and D.C. require registration for engineers whose work may affect life, health or property.
- To be registered as an electrical engineer, a person must complete four to five years of approved education in engineering, have four years of work experience, and pass an exam given by the State Board of Examineers for Professional Architects and Engineers.
- After completing college, a person may take an exam to be certified as an engineer-in-training.

TRAINING

- A bachelors degree in engineering is the minimum educational requirement.
- A graduate degree is needed to teach on the college level.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Work experience in electronics is helpful.

EDUCATIONAL PROGRAMS

251	Engineering
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, construction, manufacturing, energy and power systems, electricity and electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 16-20.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), P 66.
Military Career Guide (1988-89 ed.), pp. 300 and 301.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1634 INDUSTRIAL ENGINEERS

OCCUPATIONAL DESCRIPTION

Industrial engineers study and design ways to make the most efficient use of people, machines, and materials in business and industry. They plan equipment layout, work flow, and means to prevent accidents. They plan and oversee training programs, develop ways to control product quality, and keep production records. DOT 012.167-030

HOLLAND CODE

IER (Investigative, Enterprising, Realistic)

SPECIALTIES

Product-Safety Engineers	(012.061-010)
Quality Control Engineers	(012.167-014)
Fire-Protection Engineers	(012.167-026)
Industrial-Health Engineers	(012.167-034)
Manufacturing Engineers	(012.167-042)
Production Engineers	(012.167-046)
Production Planners	(012.167-050)
Quality-Control Engineers	(012.167-054)
Time-Study Engineers	(012.167-070)
Material Schedulers	(012.187-010)
Military Industrial Engineers	(M16340)

NCIS RELATED OCCUPATIONS

1320	Industrial Production Managers
1623	Metallurgical and Materials Engineers
1627	Nuclear Engineers
1739	Mathematical Scientists
32205	Industrial Designers
3712	Industrial Engineering Technicians

WORK ACTIVITIES

- Gather and analyze data and plan the most efficient use of people, machines, and materials.
- Solve problems in organization and production.
- Set up measurement programs and set standards for production.
- Develop computer and management systems.
- Plan space layouts for manufacturing.
- Test and inspect products and supervise quality control.
- Oversee plant safety procedures.

APTITUDES

- Be able to learn the basics of science, advanced math, and engineering.
- Have high verbal ability to read, write, and explain technical materials.
- Be able to do calculations and apply them to problems.
- Be able to visualize objects from pictures and descriptions.
- Be able to give directions to workers and make decisions based on data.
- Be able to do a variety of tasks and work with many people at various levels.

WORK SETTING

Environment

Work indoors in offices or factory areas.

Hours

Work 40 to 45 hours a week with longer hours possible to complete a project.

Employers

Manufacturing firms, construction companies, public utilities, hospitals, insurance companies, government agencies, educational institutions, transportation systems, computer centers, consulting firms, and self- employed.

CONSIDERATIONS

- Work involves logical thinking and problem solving.
- Mistakes in engineering plans may cause injury or damage.
- Work sometimes allows creativity and independent thinking.

NEBRASKA EMPLOYMENT

About 616 industrial engineers are projected to be employed by 1991.

WAGES

Starting salaries for engineers with a bachelors degree are significantly higher than starting salaries of college graduates in other fields. The median starting salary for all industrial engineers in Nebraska and nationally is approximately $28,400 a year. In Nebraska, entry level salaries range between $26,000 and $45,000 a year.

Nationally, entry level salaries range between $22,000 and $40,000 a year. Salaries will vary according to the size and location of the firm as well as the level of responsbility assigned to the position. Four out of five industrial engineers are employed in manufacturing industries.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- More complex industrial operations and automation and a growth in industry will increase the demand for industrial engineers.
- Job opportunities are influenced by the ups and downs of the economy.

PREPARATION

SKILLS

- Knowledge of high level math and sciences, engineering principles, and design.
- Skills in technical writing and speaking and computer use.
- Skills in problem solving and decision making.
- Willingness to take responsibility.

LICENSING AND CERTIFICATION

- Registration is available but not usually required.
- To be registered as an industrial engineer, a person must complete four to five years of approved education in engineering, have three to four years of work experience, and pass an exam given by the State Board of Examineers for Professional Engineers and Architects.
- After completing college, a person may take an exam to be certified as an engineer-in-training.

TRAINING

- A bachelors degree in industrial engineering is the minimum educational requirement.
- A graduate degree is required for university teaching and some other positions.
- Work experience in industry is helpful.
- Training in several specialty occupations may be obtained through apprenticeship training.
- A working knowledge of computers, electronics, and finance is also helpful.

EDUCATIONAL PROGRAMS

251	Engineering
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, economics, manufacturing, energy and power systems, drafting, electricity and electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 28-30.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 67.
Military Career Guide (1988-89 ed.), p. 302.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1635 MECHANICAL ENGINEERS

OCCUPATIONAL DESCRIPTION

Mechanical engineers design machines, products, and processes that produce, transmit, and use power. They also direct the installation, use, upkeep, and repair of equipment. Their jobs may involve production, research or administration. Many specialize in a certain area such as heat transfer, tooling, air conditioning and refrigeration, electro-mechanics, or machinery and mechanical equipment. Some do sales work or teach. DOT 007.061.-014

HOLLAND CODE

RIE (Realistic, Investigative, Enterprising)

SPECIALTIES

Automotive Engineers (007.061-010)
Facilities Mechanical-Design Engineers (007.061-018)
Products Mechanical-Design Engineers (007.061-022)
Tool Designers (007.061-026)
Manufacturing Applications Engineers (007.061-038)
Mechanical Research Engineers (007.161-022)
Mechanical Equipment Test Engineers (007.161-034)
Solar-Energy-Systems Designers (007.161-038)
Plant Engineers (007.167-014)
Military Marine Engineers (M16350)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1625	Petroleum Engineers
1626	Chemical Engineers
1627	Nuclear Engineers
1628	Civil Engineers
1633	Electrical and Electronic Engineers
32205	Industrial Designers

WORK ACTIVITIES

- Design and develop machines, products, and systems related to the use of power, energy, or other resources.
- Direct and coordinate construction, operation, and repair of power-using machines.
- Do research or testing on machines or systems.
- Do administrative tasks or teaching.

APTITUDES

- Be able to learn high levels of math and science and basic principles of engineering.
- Have high verbal ability to read, write, and explain technical materials.
- Be able to visualize objects from pictures, drawings, and descriptions and to see slight differences in objects and drawings.
- Be able to make decisions based on experience, set standards, and exact measurements.
- Have problem-solving and creative abilities.
- Be able to work with people, plan and direct projects, and work as a part of a team.

WORK SETTING

Environment

Work indoors in offices, plants, and machine shops and outdoors at power stations.

Hours

Work 40 to 45 hours a week with longer hours possible to complete a project or repairs.

Employers

Manufacturers of metals, machines, and transportation and electrical equipment; government agencies; consulting firms; educational institutions; biomedical industries; aircraft, nuclear power, and air-conditioning and heating industries; and self-employed.

CONSIDERATIONS

- Work requires logical thinking and problem solving and allows independence and use of creativity.
- Travel may be necessary.
- Engineers may be held responsible for loss of life or property if mistakes are made.

NEBRASKA EMPLOYMENT

About 1,313 mechanical engineers are projected to be employed by 1991.

WAGES

In Nebraska and nationally, three out of five jobs for mechanical engineers are found in manufacturing with a starting salary range of $28,000 to $32,000 a year depending on size and location of the firm. The balance of jobs are found in consulting firms and government agencies with a somewhat broader range of $25,000 to $35,000 a year depending on the qualifications of the candidate. Those with higher grade point averages may expect salaries at the upper end of the scale.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors

- Industrial expansion and demand for industrial machinery and machine tools should increase job opportunities.
- Other demands come from the need to solve environmental problems and to develop alternative energy systems.
- Engineers with a sales background and excellent interpersonal skills are in greater demand.

PREPARATION

SKILLS

- Knowledge of engineering principles, mechanical systems, design methods, and higher math and science.
- Skills in communicating in speaking and writing.
- Ability to plan and schedule activities and supervise workers.
- Skills in using computer technology.

LICENSING AND CERTIFICATION

- Engeineers whosework may affect public welfare must be registered by the state.
- To be registered as a mechanical engineer, a person must complete four to five years of approved engineering training, have three to four years of work experience, and pass an exam given by the State Board of Examiners of Professional Engineers and Architects.
- After completing college, a person may take an exam to be certified as an engineer-in-training.

TRAINING

- A bachelors degree in engineering is the minimum educational requirement.
- Some employers prefer applicants with graduate degrees.
- Graduate degrees are necessary for college-level teaching.
- Work experience in related fields is helpful.

EDUCATIONAL PROGRAM

251	Engineering
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, manufacturing, energy and power systems, drafting, electricity and electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 22-24.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-169.
Occupational Outlook Handbook (1990-91 ed.), p. 67.
Military Career Guide (1988-89 ed.), p. 306.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1643 LAND SURVEYORS

OCCUPATIONAL DESCRIPTION

Land surveyors measure the earth's surface to set official land boundaries and help decide land values and to provide data for map making, construction projects, and other engineering purposes. They research deeds and measure plots of land. They plan, organize, and direct the work of one or more crews engaged in surveying including preparing budgets and buying equipment and supplies. DOT 018.167-018

HOLLAND CODE

IEA (Investigative, Enterprising, Artistic)

SPECIALTIES

Land Surveying Managers (018.167-022)
Military Surveying and Mapping Managers (M16430)

NCIS RELATED OCCUPATIONS

1624	Mining Engineers
1625	Petroleum Engineers
1628	Civil Engineers
8646	Surveyor Helpers

WORK ACTIVITIES

- Locate land boundaries and natural and man-made features.
- Collect information for maps and charts.
- Mark sites for below surface exploration.
- Supervise surveying crews.
- Prepare reports and present findings to engineers and architects.

APTITUDES

- Be able to understand and use the techniques and equipment needed in land surveying.
- Have the ability to visualize objects from sketches and blueprints and to see slight differences in objects.
- Be able to write reports and do math calculations.
- Be able to make decisions based on facts, supervise and direct activities, and work according to set standards.
- Have physical coordination and ability to use hands and fingers.
- Be able to communicate verbally with effectiveness.

WORK SETTING

Environment
Work indoors in offices and outdoors at projects.

Hours
Work 40 hours a week with longer hours necessary to complete projects and take advantage of good weather.

Employers
Government agencies, construction companies, engineering and architectural firms, public utilities, attorneys, land developers, banks, and self-employed.

CONSIDERATIONS

- Work is outdoors in all kinds of weather.
- Some projects require traveling long distances.
- Work involves a great deal of physical activity.
- Surveyors are often held legally responsible for their work.

NEBRASKA EMPLOYMENT

About 321 land surveyors are projected to be employed by 1991.

WAGES

Entry level wages for land surveyors vary widely depending on the amount of postsecondary training and experience. Some employers will hire high school graduates with no experience and offer on-the-job training. In Nebraska, entry level wages for individuals with a combination of postsecondary and on-the-job training range between $15,000 and $26,800 depending on the background of the candidate. Nationally, wages are comparable to Nebraska salaries with a somewhat higher upper range of $30,000 a year for individuals with a bachelors degree. High school graduates with little or no training average approximately $12,000 a year on survey crews with the federal government. Most of these positions are seasonal temporary jobs, few individuals work full time year round at this level.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Somewhat Favorable

Factors
- Some employment is on a part-time or seasonal basis.
- Demand for land surveyors is influenced by the ups and downs of the economy.

PREPARATION

SKILLS

- Knowledge of higher level math and science, electronics, and surveying methods and equipment.
- Knowledge of survey and record laws, legal principles of boundaries, and state history.
- Skills in report writing, mechanical drawing, and supervising.
- Willingness to take responsibility and to make decisions.
- Knowledge of computer science.

LICENSING AND CERTIFICATION

- Workers must be registered by the State Board of Examiners for Land Surveyors.
- Qualifications for registration include passing an oral and written exam and completing six years of surveying experience or a combination of education and experience in a responsible position.
- A person may become a surveyor- in-training after completing four years of training or experience and passing an exam.

TRAINING

- A combination of postsecondary and on-the-job training is needed.
- Schools in other states offer bachelors degrees in surveying, cartography, or geodesy.
- Another option is a bachelors degree in civil engineering.
- Technical schools offer one-, two-, or three-year programs in surveying and drafting.
- Surveyors should graduate from a program approved by the State Board of Examiners.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAMS

251	Engineering
253	Engineering Technologies
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, physics, history, government, geography, commercial and graphic art, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 33-35.
Guide for Occupational Exploration (2nd ed., 1984), pp. 176-181.
Occupational Outlook Handbook (1990-91 ed.), p. 74.
Military Career Guide (1988-89 ed.), p. 313.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11959	Hawkeye Institute of Technology
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1712 COMPUTER SYSTEMS ANALYSTS

OCCUPATIONAL DESCRIPTION

Computer systems analysts plan ways to use computers to solve scientific, engineering, and business problems. They determine what information must be collected, the equipment needed, and the steps to be followed in solving the problems. Once a system has been developed, they prepare charts, diagrams and reports to describe its operations and to help cleints understand the proposed plan.

HOLLAND CODE

IER (Investigative, Enterprising, Realistic)

SPECIALTIES

Electronic Data Processing Systems Analysts (012.167-066)
Military Computer Systems Analysts (M17120)
Military Computer Systems Development Officers (M17121)
Military Operations Analysts (M17122)

NCIS RELATED OCCUPATIONS

1420	Management Analysts
1732	Actuaries
1733	Statisticians
1739	Mathematicians
1843	Physicists
3971	Computer Programmers
4612	Computer Operators

WORK ACTIVITIES

- Gather and analyze information about systems being used.
- Recommend ways to make improvements.
- Design and develop new systems including computers.
- Plan and prepare instructions, technical reports, charts, and diagrams.
- Confer with people, attend meetings, and make presentations and proposals.
- Write detailed logical and mathematical steps to be performed on the computer.
- May specialize in business, science, or engineering.

APTITUDES

- Have ability to learn the basics of electronic data processing and mathematical systems.
- Be able to think logically and solve problems.
- Be able to communicate ideas in speaking and writing.
- Be able to make decisions based on collected data.
- Have ability to see space and form relationships and to work with details.
- Be able to listen to and work with people of differing skills and backgrounds.

WORK SETTING

Environment
    Work indoors in offices.
Hours
    Work 40 hours a week with some longer hours required to meet deadlines.
Employers
    Manufacturing companies, banks, insurance companies, government agencies, wholesale and retail businesses, data processing firms, scientific laboroatories, and universities.

CONSIDERATIONS

- Work requires long periods of logical thinking and concentration.
- Some projects require considerable travel.
- Work allows some independence and use of creativity.
- Job requires working on teams on large projects.
- Systems analysts may advance to senior staff management jobs.

NEBRASKA EMPLOYMENT

About 3,593 systems analysts are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for computer systems analysts with a bachelors degree range between $20,000 and $27,500 a year. Starting salaries for individuals with a masters degree range up to $40,000 a year. Nationally, entry level salaries compare favorably with Nebraska with a somewhat higher upper range of $45,000 a year. The size and location of the employer, level of responsibility, and academic background of the candidate are determining factors regarding the starting wage.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- Demand is expected to rise as advances in technology lead to new applications for computers.
- Use of computer systems will expand and increase job opportunities.
- People with professional training and job experience in this field will find the best opportunities.

PREPARATION

SKILLS

- Knowledge of computers, program languages, processes, and computer hardware.
- Knowledge of math and business.
- Skills in organization, logical thinking, problem solving, and technical writing.
- Ability to listen and understand views of others and to explain complex ideas.

LICENSING OR CERTIFICATION

- Systems analysts gain professional recognition by passing an exam and getting a certificate from the Institute of Certification of Computer Professionals.

TRAINING

- Almost all positions require a bachelors degree and some employers require an advanced degree.
- Appropriate degree areas are computer science, information science, or data processing.
- Background in accounting, math, business management, or engineering along with a knowledge of programming would be adequate for some jobs.
- Training in several specialty occupations may be obtained through apprenticeship training.
- Some systems analysts are trained on-the-job through work experience.

EDUCATIONAL PROGRAM

155	Business Data Processing
211	Computer and Information Sciences
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, chemistry, physics, psychology, manufacturing, computer science, accounting, and data processing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 29.
Guide for Occupational Exploration (2nd ed., 1984), pp. 524-526.
Occupational Outlook Handbook (1990-91 ed.) p. 77.
Military Career Guide (1988-89 ed.), pp. 80, 299, and 310.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus

22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1732 ACTUARIES

OCCUPATIONAL DESCRIPTION

Actuaries help insurance companies and pension programs set their rates. They try to determine how likely incidences of death, sickness, unemployment, and property loss will be among various groups of people. They then detemine the amounts of premiums needed to ensure that the companies can pay all claims and expenses. DOT 020.167-010

HOLLAND CODES

ISE (Investigative, Social, Enterprising)

NCIS RELATED OCCUPATIONS

1414	Underwriters
1712	Computer Systems Analysts
1733	Statisticians
1912	Economists
19122	Market-Research Analysts I
4794	Statistical Clerks

WORK ACTIVITIES

- Organize and analyze statistics.
- Determine the expected insured loss and insurance premium rates.
- Design or review insurance policies.
- Set values for pension plans.
- Prepare financial statements.
- May specialize in one type of insurance such as life or property.
- May work for a private firm to administer pension and group insurance plans.

APTITUDES

- Be able to learn the principles of actuarial science.
- Be able to communicate in speaking and writing.
- Have good math abilities.
- Be able to plan, organize, and make decisions based on data.
- Be able to work with precise details, compile accurate data, and take responsibility for the direction of a project.

WORK SETTING

Environment
Work indoors in an office.

Hours
Work 40 hours a week.

Employers
Insurance companies, rating bureaus, government agencies, actuarial consulting firms, and businesses and organizations that administer their own insurance and pension funds.

CONSIDERATIONS

- Job requires long hours of concentration.
- Work offers a variety of work functions to match many interests.
- Extensive study is needed to pass the required exams.
- Work allows person to apply math principles to business decisions.

NEBRASKA EMPLOYMENT

About 327 actuaries are projected to be employed by 1991.

WAGES

In Nebraska, new college graduates with a bachelors degree without having passed any actuarial exams average about $25,000 a year. Entry level salary ranges expand to $31,000 for individuals who have completed the first exam. Nationally, entry level salaries range between $22,000 and $37,000 a year depending on the size and location of the employer, academic preparation and area of specialization, and number of actuarial exams completed.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Job opportunities are increasing because insurance sales are expected to grow and insurance practices are changing.
- Demand is greater in larger metropolitan areas.
- Competition may be strong for specialized areas.

PREPARATION

SKILLS

- Knowledge of higher levels of math, actuarial science, insurance systems, and economics.
- Skills in communication.
- Knowledge of computer science.
- Willingness to make decisions and take responsibility.

LICENSING AND CERTIFICATION

- A person may become a Fellow of the Society of Actuaries (F.S.A.) by passing a series of ten exams which usually takes from five to ten years. (The work involved is about the same as earning a doctorate in math.)
- An actuary must become further certified to specialize in pension.

TRAINING

- A bachelors degree in math, statistics, or actuarial science is preferred.
- Other options are degrees in engineering, business administration, or economics with an emphasis in math.
- Masters degrees in actuarial science are available.
- Passing a series of exams from the Society of Actuaries is important for success in this field.

EDUCATIONAL PROGRAMS

143	Banking and Finance
145	Business Administration & Management
148	Insurance
481	Mathematics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, government, economics, sociology, business law, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 38.
Guide for Occupational Exploration (2nd ed., 1984), pp. 524-526.
Occupational Outlook Handbook (1990-91 ed.), p. 76.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
44826	Teller Training Institute
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1733 STATISTICIANS

OCCUPATIONAL DESCRIPTION

Statisticians devise, carry out, and interpret the numerical results of surveys and experiments. They often apply their knowledge in a certain subject area such as economics, human behavior, natural science, or engineering. They prepare verbal or written reports, graphs, charts, and other types of presentations to show the results of their studies.

HOLLAND CODES

IRC (Investigative, Realistic, Conventional)

SPECIALTIES

Mathematical Statisticians (020.067-022)
Financial Analysts (020.167-014)
Applied Statisticians (020.167-026)

NCIS RELATED OCCUPATIONS

1412	Accountants and Auditors
1622	Aerospace Engineers
1712	Computer Systems Analysts
1732	Actuaries
1739	Mathematical Scientists
1843	Physicists
1912	Economists
19121	Market-Research Analysts I
1916	Sociologists
3971	Computer Programmers
4794	Statistical Clerks

WORK ACTIVITIES

- Apply statistical methods to a specific subject area.
- Design surveys and questionnaires.
- Interpret numerical results of surveys and experiments to make predictions and draw conclusions.
- Evaluate sources of information to decide how reliable they are and also describe the sources and their use.
- Use graphs, charts, and written and verbal reports to present information.
- Use computers.

APTITUDES

- Have ability to generalize from the specific and think abstractly.
- Be able to draw conclusions from data, experience, and observations.
- Have math and verbal aptitudes to do research, apply math concepts to practical problems, read materials from various fields, and write technical reports.
- Be able to plan and organize projects, keep accurate records, and work within set standards.

WORK SETTING

Environment
Work indoors in offices and data processing or resource areas.

Hours
Work 40 hours a week with longer hours possible.

Employers
Manufacturing companies, public utilities, insurance companies, government agencies, banks, universities, and research and consulting firms.

CONSIDERATIONS

- Job may require long hours of concentration and logical thinking.
- Work is in a field where statistics can be applied to everyday problems.
- Some travel may be required.
- Statisticians often work as part of a team.

NEBRASKA EMPLOYMENT

About 184 statisticians are projected to be employed by 1991.

WAGES

Entry level salaries for statisticians with a bachelors degree range between $17,300 and $30,000 a year in Nebraska. Factors which will determine the starting wage are the size and location of the employer, level of responsibility and academic preparation of the recent graduate. Nationally, entry level salaries parallel those of Nebraska with a slightly broader range of $15,000 to $32,500 a year. Higher salaries will be found in federal government.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Good opportunities are available because of a current shortage of people in all areas of statistics.
- Private industry is finding new uses for statisticians, computerized data processing, and research.

PREPARATION

SKILLS

- Knowledge of math, statistical methods, computer processing, and data collection.
- Knowledge of at least one applied area such as economics, human behavior, engineering, or public health.
- Skills in analysis and drawing conclusions.
- Skills in communication to present results of statistical analysis in speeches and reports.

TRAINING

- Bachelors degree is the minimum educational requirement with many jobs requiring an advanced degree in statistics.
- Another option is a major in an applied area such as economics and a minor in statistics.
- Work experience especially with computers and statistics courses from several different departments would be helpful.

EDUCATIONAL PROGRAMS

481	Mathematics
581	Social Sciences
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, literature, advanced math, biology, chemistry, physics, economics, sociology, psychology, data processing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 38.
Guide for Occupational Exploration (2nd ed., 1984), pp. 524-526.
Occupational Outlook Handbook (1990-91 ed.), p. 82.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1739 MATHEMATICIANS

OCCUPATIONAL DESCRIPTION

Mathematicians conduct research and analyze numerical data to solve problems in science, industry, and other fields. They study and test theories used to explain facts or events and look for new uses of algebra, geometry, and calculus. They use calculators and computers and prepare graphs, charts, and reports. Some teach, do research, or do consulting work. DOT 020.067-014

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Weight Analysts (020.187-018)
Cryptanalysts (199.267-014)

NCIS RELATED OCCUPATIONS

1412	Accountants and Auditors
1622	Aerospace Engineers
1634	Industrial Engineers
1712	Computer Systems Analysts
1732	Actuaries
1733	Statisticians
1843	Physicists
1846	Meteorologists
1912	Economists
19121	Market-Research Analysts I
4794	Statistical Clerks

WORK ACTIVITIES

- Propose new theories, formulate original concepts, and devise new approaches to the solution of mathematical problems.
- Develop and test theories and techniques helpful in solving practical problems.
- Apply math to other fields such as engineering, economics, and business.
- Do computations, operate calculators, use computers, and teach students.
- May concentrate on either theoretical or applied mathematics.

APTITUDES

- Have ability to learn principles and processes of high level math.
- Be able to analyze, reason from specific data to general ideas, and solve problems.
- Have understanding of space relationships, persistence, and ability to work with exact details.
- Be able to communicate ideas in writing and speaking and work with people as a member of a team.

WORK SETTING

Environment
Work indoors in offices, laboratories, or computer rooms.
Hours
Work 40 hours a week with longer hours possible.
Employers
Educational institutions, private industry and business, government agencies, and research and consulting firms.

CONSIDERATIONS

- Job includes long periods of concentrating and many hours of reading and figuring.
- Job requires high levels of abstract thinking, logical reasoning, and use of data.

NEBRASKA EMPLOYMENT

About 88 mathematicians are projected to be employed by 1991.

WAGES

Entry level salaries in Nebraska range between $18,000 and $30,000 a year depending on the degree or degrees completed and the size and location of the employer. A somewhat higher entry level range will be found outside Nebraska of between $19,500 and $35,000 a year. Although salaries are generally higher in industry than in government or educational institutions, most mathematicians are employed by the federal government in the Department of Defense.

EMPLOYMENT OUTLOOK

Nebraska
Somewhat Favorable
National
Somewhat Favorable

Factors

- Little employment growth is expected in colleges where most mathematical scientists now work.
- More opportunities are expected in applied math areas such as statistics, engineering, and computer science.

PREPARATION

SKILLS

- Knowledge of higher level math, mathematical techniques, statistics, and computer science.
- Ability to think abstractly and generalize from data.
- Ability to apply mathematical theory to practical uses.
- Ability to present results both orally and in writing.

TRAINING

- Bachelors degree in math is the minimum educational requirement.
- Advanced degrees are required in university positions and many other jobs.
- For work in applied math, study in a field of application is needed.

EDUCATIONAL PROGRAMS

481 Mathematics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including composition, foreign language, advanced math, business math, economics, earth science, chemistry, physics, manufacturing, energy and power systems, typing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 37, 39, and 150.
Guide for Occupational Exploration (2nd ed., 1984), pp. 114-116 and 554-557.
Occupational Outlook Handbook (1990-91 ed.), p. 79.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1843 PHYSICISTS

OCCUPATION DESCRIPTION

Physicists use the principles, laws, and theories of matter and energy to help solve problems in science, industry, medicine, and other fields. Some do research to increase scientific knowledge, and others do research to help develop new products and processes. Many teach and do research in educational institutions. DOT 023.061-014

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

SPECIALITIES

Electro-Optical Engineers (023.061-010)
Theoretical Physicists (023.067-010)
Health Physicists (079.021-010)
Medical Physicists (079.021-014)
Military Physicists (M18430)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1623	Metallurgical and Materials Engineers
1627	Nuclear Engineers
1712	Computer Systems Analysts
1733	Statisticians
1739	Mathematicians
1845	Chemists
1846	Meteorologists
1847	Geologists
1854	Biological Scientists
1855	Medical Scientists
3890	Science Technologists

WORK ACTIVITIES

- Develop theories and laws by doing experiments and making observations.
- Apply findings in practical ways.
- Prepare technical reports to communicate findings.
- Study relationships between matter and energy.
- May specialize in applied or theoretical research.

APTITUDES

- Have ability to learn the complex principles of physics and other maths and sciences.
- Be able to visualize objects from sketches and descriptions and see slight differences in objects.
- Be able to make decisions based on facts, measurable factors, and observations.
- Have ability to follow complex processes and instructions.
- Be able to move quickly from one task to another using different skills.
- Have average physical coordination and finger dexterity to do detailed experimental work precisely.

WORK SETTING

Environment
Work indoors in offices or laboratories.
Hours
Work 40 hours a week with longer hours possible to complete a project.
Employers
Private industries, hospitals, commercial laboratories, public utilities, government agencies, educational institutions, high-tech manufacturers, and engineering and consulting firms.

CONSIDERATIONS

- Work involves applying scientific knowledge to practical problems and possibly helping in the progress of science and technology.
- Constant study is necessary to keep informed.
- Some physicists spend a lifetime doing research in one small area of knowledge.

NEBRASKA EMPLOYMENT

About 107 physicists are projected to be employed by 1991.

WAGES

Starting salaries for physicists with a masters degree employed in the private sector range between $21,000 and $30,000 a year in Nebraska. Nationally, the entry level range is somewhat higher than Nebraska at $25,000 to $45,000 a year depending on college records, and the size and geographic location of the employer. Starting salaries tend to be somewhat lower for physicists employed by the Federal Government.

A large portion of physicists are employed on defense-related projects in both the public and private sector.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- New developments in energy resources, medicine, and space research have increased the demand for physicists.
- More competition exists for positions in university teaching than in private industry.
- The outlook is very favorable but this is a small occupational group in Nebraska.

PREPARATION

SKILLS

- Knowledge of the theories of physics, laboratory techniques, complex math, computer science, and mechanical systems.
- Ability to apply knowledge of scientific theories and laboratory and research skills.
- Ability to work independently without close supervision.
- Skills in technical writing.
- Knowledge of energy resources.

TRAINING

- A few positions as technicians or assistants are available for people with bachelors degrees.
- Most entry-level jobs require a masters or doctorate in physics.
- Skills in computer programming improve chances for a job.

RELATED PROGRAM

521	Physical Sciences
529	Physics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, foreign language, advanced math, earth science, chemistry, physics, energy and power systems, manufacturing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 40 and 63.

Guide for Occupational Exploration (2nd ed., 1984), pp. 114-116, 118-120, and 161-166.

Occupational Outlook Handbook (1990-91 ed.), p. 94.

Military Career Guide (1988-89 ed.), p. 311.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21504	Concordia College
21805	Creighton University
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

1845 CHEMISTS

OCCUPATIONAL DESCRIPTION

Chemists study substances and materials and their reaction to each other when brought together. They use their knowledge to develop chemical compounds and to improve products and processes. Most chemists work in research and development; however, some work in other areas such as production and inspection, sales, consulting, and teaching. DOT 022.061-010

HOLLAND CODES

IER (Investigative, Enterprising, Realistic)

SPECIALTIES

Food Chemists (022.061-014)
Laboratory Supervisors (022.137-010)
Chemical-Laboratory Chiefs (022.161-010)
Military Chemists (M18450)

NCIS RELATED OCCUPATIONS

1623	Metallurgists and Materials Engineers
1626	Chemical Engineers
1843	Physicists
18451	Biochemists
18452	Biologists
1853	Agricultural and Food Scientists
1854	Biological Scientists
1855	Medical Scientists
3010	Pharmacists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36904	Sanitarians
3831	Chemical Technologists and Technicians

WORK ACTIVITIES

- Study and apply knowledge about chemical properties.
- Design and conduct research projects.
- Interpret and analyze the results of research and apply their findings to practical purposes.
- Create and improve products needed by industry and consumers.
- Design production and inspection procedures.
- Prepare technical reports to explain findings.
- May specialize in various kinds of chemistry such as organic, inorganic, analytical, physical, or biochemical.

APTITUDES

- Be able to understand and apply complex sciences, math, and laboratory techniques.
- Be able to read, write, and speak about technical information.
- Have ability to visualize objects from pictures and descriptions and to see slight differences in objects.
- Have ability to attend to detail and to do precise work.
- Be able to make decisions based on data.
- Have good use of hands and fingers and average physical coordination.
- Be able to plan, organize, give directions to others, and work with set standards.

WORK SETTING

Environment
    Work indoors in offices or laboratories.
Hours
    Work 40 hours a week with longer hours possible to complete a project.
Employers
    Manufacturing companies, government agencies, universities, non-profit research organizations, and wholesalers of chemicals.

CONSIDERATION

- Work gives chance to use scientific knowledge to solve problems.
- Constant study is necessary to keep informed of new discoveries.
- May handle potentially hazardous materials.

NEBRASKA EMPLOYMENT

About 414 chemists are projected to be employed by 1991.

WAGES

Starting salaries for chemists with a bachelors degree and little or no experience range between $20,300 and $30,000 a year in Nebraska. Nationally the salary range is somewhat higher than Nebraska at $23,000 to $40,000 a year. Chemists with graduate degrees may expect salaries at the upper end of the scale. The entry level salary range for chemists employed by the Federal Government parallels that of Nebraska.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors
- Research and development money available from industry and government will increase job openings for chemists doing research.
- Chemists with doctorates will have the best job opportunities.

PREPARATION

SKILLS

- Knowledge of chemistry, math, computer science, and electronics.
- Knowledge of research and methods of testing.
- Skills to understand and use technical languages.
- Ability to interpret charts and graphs and to communicate with others.
- Ability to apply scientific theories to problem solving.
- Ability to work independently and make decisions.

TRAINING

- A bachelors degree in chemistry is the minimum educational requirement and is adequate for many entry-level jobs.
- An advanced degree is essential for most research jobs and for college-level teaching.
- Job experience in a related field during college is helpful.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAMS

521	Physical Sciences
524	Chemistry
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, foreign language, advanced math, earth science, chemistry, physics, manufacturing, electricity and electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 39.
Guide for Occupational Exploration (2nd ed., 1984), pp. 114-116, 118-121, and 127-131.
Occupational Outlook Handbook (1990-91 ed.), p. 90.
Military Career Guide (1988-89 ed.), p. 29

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1846 METEOROLOGISTS

OCCUPATIONAL DESCRIPTION

Meteorologists gather and analyze information on atmospheric conditions. They provide long-range and short-range weather forecasts. Some determine probable long-range changes in weather, and others work to produce weather changes. Others do research or teach. DOT 025.062-010

HOLLAND CODES

IRS (Investigative, Realistic, Social)

SPECIALTIES

Military Meteorologists (M18460)

NCIS RELATED OCCUPATIONS

1739	Mathematical Scientists
1843	Physicists
1847	Geologists
1852	Forestry and Soil Conservation Scientists
3890	Science Technologists and Technicians

WORK ACTIVITIES

- Prepare, study, and interpret summary reports, maps, photographs, and charts to predict long- and short-range weather conditions.
- Give weather information to the media and provide specialized forecasts for aviation, agriculture, fire prevention, air pollution and military activities.
- Conduct research on properties of atmosphere.
- Study past records of the weather.
- Work to understand and control such problems as air pollution and acid rain.

APTITUDES

- Be able to learn and apply the principles and techniques of meteorology and higher level math.
- Have high verbal abilities to read technical information, write reports, and explain to others about weather factors.
- Be able to plan, analyze, and make decisions based on data and visual observation.
- Have average physical coordination.
- Be able to visualize objects from pictures and drawings, to see slight differences in objects, and to keep records.

WORK SETTING

Environment
    Work indoors in offices and weather stations usually located in airports.

Hours
    Work 40 hours a week with night, weekend, or rotating shifts.

Employers
    National Weather Service, other government agencies, commercial airlines, manufacturing companies, educational institutions, consulting firms, and radio and television stations.

CONSIDERATIONS

- Work involves interpreting scientific data and applying it to practical uses.
- Some weather stations are located in remote areas.

NEBRASKA EMPLOYMENT

About 36 meteorologists are projected to be employed by 1991.

WAGES

The largest employer of civilian meteorologists is the National Oceanic and Atmospheric Administration which operates National Weather Service stations in all parts of the United States. Starting salaries for meteorologists in the Federal Government with a bachelors degree and little or no experience range between $17,000 and $22,000 a year. Meteorologists with graduate degrees may expect an entry level salary range of between $22,000 and $40,000 a year depending on the degree and their grades. Entry level salaries for all meteorologists in Nebraska range between $15,000 and $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable

National
    Somewhat Favorable

Factors

- More meteorologists may be needed as private industry tries to prevent air pollution.
- Job opportunities will increase as radio and television stations hire specialists to prepare and give weather forecasts.
- The outlook is very favorable but this is a very small occupational group in Nebraska.

PREPARATION

SKILLS

- Knowledge of advanced math, physics, computer science, meteorology, and laboratory and field techniques.
- Skills in communications to explain technical information.
- Ability to understand and operate a wide variety of instruments.
- Ability to make and read maps and graphs.
- Ability to make decisions, assume responsibility, and direct others in work.
- Skills in analyzing and evaluating data.

TRAINING

- A bachelors degree in meteorology is usually required for entry-level positions.
- Advanced degrees are required for research and college-level teaching positions and job promotion.
- Minimum requirement for employment in the National Weather Service is a bachelors degree with at least 20 hours of physics and math.
- Some employers accept applicants with degrees in math, physics, journalism, or other science fields including courses in meteorology.
- College students can obtain summer jobs or enroll in a cooperative education program with the National Oceanic and Atmospheric Administration (NOAA).
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
481	Mathematics
523	Meteorology
529	Physics
533	Science Technologies
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, journalism, advanced math, earth science, biology, chemistry, physics, geography, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 42.

Guide of Occupational Exploration (2nd ed., 1984), pp. 114-116.

Occupational Outlook Handbook (1990-91 ed.), p. 93.

Military Career Guide (1988-89 ed.), p. 307.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11958	Florida Institute of Technology
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11954	University of Hawaii at Manoa
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1847 GEOLOGISTS

OCCUPATIONAL DESCRIPTION

Geologists study the origin, history, composition, and structure of the earth's crust. Some study for practical purposes such as locating water, gas, and oil supplies. Others study for scientific knowledge. Some work primarily in teaching, research, and consultation. DOT 024.061-018

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Oceanographer (024.061-018)
Petroleum Geologists (024.061-022)
Geophysical Prospectors (024.061-026)
Geophysicists (024.061-030)
Hydrologists (024.061-034)
Mineralogists (024.061-038)
Paleontologists (024.061-042)
Seismologists (024.061-050)
Soils Engineers (024.161-010)
Military Oceanographers (M18470)

NCIS RELATED OCCUPATIONS

1623	Metallurgical and Materials Engineers
1624	Mining Engineers
1625	Petroleum Engineers
1843	Physicists
1846	Meteorologists

WORK ACTIVITIES

- Conduct geologic surveys, take measurements, and collect data.
- Use knowledge of chemistry, physics, math, and biology to analyze data, write reports, and recommend action.
- Supervise field crews.
- Prepare geologic maps and graphs.
- Do precision work with instruments and tools in the field and laboratories.
- Apply knowledge in practical ways.
- May specialize in earth materials, earth processes, or earth history.

APTITUDES

- Be able to learn techniques of geologic analysis.
- Have high verbal ability in order to read, write, and explain technical materials.
- Be able to keep accurate records, make decisions based on data and observation, and work with precise standards.
- Have ability to picture objects from drawings and descriptions and to see and describe details in objects.
- Have high math abilities.
- Be in good physical condition and be able to use hands.

WORK SETTING

Environment
Work indoors in offices and laboratories and outdoors in the field.
Hours
Work 40 or more hours a week; hours may be irregular.
Employers
Oil and natural gas industries, government agencies, museums, educational institutions, mining and exploration companies, construction firms, engineering firms, research organizations, consulting firms, and self-employed.

CONSIDERATIONS

- Work is often done outdoors in all kinds of weather.
- May include travel and work in remote regions.
- Job involves light physical work and walking.
- Job offers opportunity to contribute to economic development.

NEBRASKA EMPLOYMENT

About 122 geologists are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for graduates with a bachelors degree in physical and earth sciences range between $17,300 and $22,000 a year. Individuals with a masters degree employed to conduct research or teach at a college level may expect a starting wage within the $22,000 to $35,400 a year range. Nationally, the starting salary range for all geologists is somewhat higher with an upper range of up to $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- The need to locate new sources of minerals and energy will increase demand.
- People with advanced degrees will have better opportunities.
- There will be an increasing number of job opportunities abroad.

PREPARATION

SKILLS

- Knowledge of geologic principles, math, physics, chemistry, biology, computer science, and English composition.
- Knowledge of laboratory and field research techniques and approaches to solving problems through scientific methods.
- Skills in using geologic tools, remote sensing, air photo interpretation, rock identification, and maps.
- Ability to work with other people.
- Ability to do a variety of tasks.

TRAINING

- Entry-level jobs require at least a bachelors degree in geology.
- Many research and college teaching positions require advanced degrees.
- Some employers accept a degree in computer science with course work in geologic sciences.

EDUCATIONAL PROGRAM

481	Mathematics
521	Physical Sciences
524	Chemistry
526	Geology
529	Physics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, geography, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 41.

Guide for Occupational Exploration (2nd ed., 1984), pp.114-116.

Occupational Outlook Handbook (1990-91 ed.), p. 91.

Military Career Guide (1988-89 ed.), p. 309

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1852 FORESTRY AND SOIL CONSERVATION SCIENTISTS

OCCUPATIONAL DESCRIPTION

Forestry and soil conservation scientists manage, develop, and help protect forests, rangeland, soil, and other natural resources. They help provide habitats for wildlife, sites for recreational activities, lumber supplies, and livestock forage. Also they help protect soil, minerals, and water.

HOLLAND CODES

IRS (Investigative, Realistic, Social)

SPECIALTIES

Forest Ecologists (040.061-030)
Foresters (040.061-034) (18521)
Range Managers (040.061-046)
Silviculturists (040.061-050)
Soil Conservationists (040.061-054) (18522)
Wood Technologists (040.061-062)
Soil Conservation Technicians (040.261-010)
Park Naturalists (049.127-010)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1846	Meteorologists
18531	Agronomists
18532	Soil Scientists
1854	Biological Scientists
18542	Biologists
18543	Botanists
23903	County-Agricultural Agents
5512	General Farmers

WORK ACTIVITIES

- Plan and supervise the growing, protection, and harvesting of trees.
- Protect wildlife and manage watersheds.
- Develop and supervise parks and camps.
- Manage, improve, and protect rangelands.
- Provide technical assistance to farmers, ranchers, and others concerned with conservation of soil, water, and related natural resources.
- Do research and teach.

APTITUDES

- Be able to learn the various sciences that apply to use and conservation of natural resources.
- Have verbal abilities to understand technical materials, write reports, and communicate with people.
- Be able to supervise people, plan and direct projects, and make decisions.
- Be able to handle a variety of activities.
- Be able to keep records.

WORK SETTING

Environment

Work outdoors and indoors in offices and laboratories.

Hours

Work 40 hours a week with some longer hours necessary.

Employers

Government agencies, educational institutions, rural banks, insurance companies, land management and real estate firms, consulting firms, timber industries, ranchers and farmers, consulting firms, and Soil Conservation Service.

CONSIDERATIONS

- Job may involve work outdoors in all kinds of weather.
- Work involves application of scientific theory to practical problems.
- Job may include travel and job sites in isolated areas.
- Job may provide satisfaction through preservation of resources.

NEBRASKA EMPLOYMENT

About 399 forestry and conservation scientists are projected to be employed by 1991.

WAGES

In Nebraska, forestry and soil conservation scientists with a minimum of a bachelors degree may expect an entry level salary between $15,000 and $27,000 a year depending on college records and experience. Nationally, the starting salary range for all forestry and conservation scientists varies considerably depending on the level of education completed and the level of responsibility. Entry level salaries range between $16,000 and $35,000 a year. Salaries tend to fall in the upper end of the scale for Federal Government employees. Salaries in State and local government and in private industry tend to be at the lower end of the scale.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Unfavorable
Factors

- Most job openings will be created by the need to replace those who retire or transfer to another occupation.
- The federal government, the major employer, is not expected to increase its employment of forestry and soil conservation scientists.
- Employment should grow faster in private industry than in government agencies.

PREPARATION

SKILLS

- Knowledge of basic sciences, math, agriculture, soil and animal sciences, and botany.
- Skills in technical report writing and speaking.
- Skills in map reading and preparation.
- Expertise in problem solving, research techniques, and management.
- Be able to plan and direct projects and supervise people.
- Skills in recordkeeping.
- Ability to work independently.

TRAINING

- A bachelors degree is the minimum educational requirement.
- A graduate degree is required for research and teaching at a college or university.
- Previous work experience in a related field is helpful.
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

111	Agricultural Production
112	Animal Sciences
113	Soil Sciences
116	Agricultural Business and Management
118	Forestry and Natural Resources
521	Physical Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biological and physical sciences, chemistry, math through trigonometry, agriculture, geography, and drafting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 45 and 50.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121 and 134-137.
Occupational Outlook Handbook (1990-91 ed.), p. 88.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
11902	Colorado State University
21504	Concordia College
21507	Doane College
21509	Hastings College
11907	Iowa State University
11908	Kansas State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
11922	University of Missouri-Columbia
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18521 FORESTERS

OCCUPATIONAL DESCRIPTION

Foresters manage and develop forest lands and their resources for economic, social, and recreational purposes. They manage timber holdings. Most specialize in one area of work such as reforestation, fire prevention and control, processing wood, or research. DOT 040.061-034

HOLLAND CODES

RIS (Realistic, Investigative, Social)

SPECIALTIES

Forest Ecologists (040.061-030)
Silviculturists (040.061-050)
Wood Technologists (040.061-062)

NCIS RELATED OCCUPATIONS

18522	Soil Conservationists
1853	Agricultural and Food Scientists
18531	Agronomists
18532	Soil Scientists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18543	Botanists
5134	Sheriffs, Bailiffs, and Law Enforcement Officers
5720	Forestry Workers

WORK ACTIVITIES

- Gather and analyze information about the forest.
- Interpret findings and formulate policies and programs involving forestation, timber sales, recreational use, flood and insect control, and soil erosion.
- Inform the public of management and protection programs.
- Make maps and survey roads and trails.
- Supervise other people
- Plan and direct projects.
- May specialize in timber management, outdoor recreation, wood science, or forest protection.

APTITUDES

- Be able to learn the various sciences that apply to forestry.
- Be able to work with a variety of people and to give directions.
- Have verbal abilities to understand techncial materials and write reports.
- Be able to work with numbers and keep records.
- Be able to make decisions based on data.

WORK SETTING

Environment
Work both indoors and outdoors.
Hours
Work 40 to 50 hours with longer hours needed for emergency duties.
Employers
Government agencies, educational institutions, consulting firms, timber companies, utility companies, lumber and wood product companies, and self- employed.

CONSIDERATIONS

- Forestry involves preserving natural resources.
- Work is done outside in all kinds of weather and sometimes in remote areas.
- Forestry includes a variety of tasks and the opportunity to specialize.
- The work can be physically demanding.

NEBRASKA EMPLOYMENT

About 399 forestry and conservation scientists are projected to be employed by 1991. Foresters are part of this group.

WAGES

In Nebraska, forestry and soil conservation scientists with a minimum of a bachelors degree may expect an entry level salary between $15,000 and $27,000 a year depending on college records and experience. Nationally, the starting salary range for all forestry and conservation scientists varies considerably depending on the level of education completed and the level of responsibility. Entry level salaries range between $16,000 and $35,000 a year. Salaries tend to fall in the upper end of the scale for Federal Government employees. Salaries in State and local government and in private industry tend to be at the lower end of the scale.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Unfavorable
Factors
- Number of people earning forestry degrees is greater than demand.
- Opportunities are expected to be better with private companies than government agencies.
- Cutbacks in federal funding have reduced opportunities.

PREPARATION

SKILLS

- Knowledge of complex math, botany, and computer science.
- Skills in map preparation and reading, research techniques, technical writing, and speaking.
- Ability to make decisions and work alone and with others.
- Skills in administration.

TRAINING

- A bachelors degree is the minimum educational requirement.
- Advanced degrees are becoming necessary because of the growing competition.
- Graduate degrees are required for college teaching and research positions.

EDUCATIONAL PROGRAM

111	Agricultural Production
118	Forestry and Natural Resources
521	Physical Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, earth science, biology, chemistry, physics, geography, vocational agriculture, drafting, computer science, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 45.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121 and 134-137.
Occupational Outlook Handbook (1990-91 ed.), p. 88.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
11902	Colorado State University
21504	Concordia College
21507	Doane College
21509	Hastings College
11907	Iowa State University
11908	Kansas State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
11922	University of Missouri-Columbia
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18522 SOIL CONSERVATIONISTS

OCCUPATIONAL DESCRIPTION

Soil conservationists plan, develop, and coordinate practices for proper use and conservation of land and its resources for agricultural, commercial, residential, or public uses. They study soil and water conservation problems and supervise effective solutions. They see that these conservation practices are maintained. DOT 040.061-054

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
18521	Foresters
1853	Agricultural and Food Scientists
18531	Agronomists
18532	Soil Scientists
18541	Biochemists
23903	County-Agricultural Agents
5512	General Farmers

WORK ACTIVITIES

- Study soil and water conservation problems and recommend and supervise solutions.
- Plan and develop water and land resource programs.
- Work with individual landowners and agencies and organizations concerned with soil and water conservation.
- Conduct surveys and prepare maps and reports.
- Aid in planning recreation or fish and wildlife areas.
- Prepare cost estimates and budgets.

APTITUDES

- Have ability to learn scientific theories and apply them to practical problems.
- Have strong math abilities, good form perception, and ability to visualize distances.
- Have verbal abilities to communicate with people, write technical reports, and understand scientific reading materials.
- Be able to plan and direct projects, supervise people, and make decisions based on measurable data and visual observation.
- Be able to work with others.

WORK SETTING

Environment

Work outdoors at field sites and indoors in offices or labs.

Hours

Work 40 hours a week; longer hours may be required at times.

Employers

Government agencies, educational institutions, insurance companies, rural banks, mortgage companies, and Soil Conservation Service.

CONSIDERATIONS

- Job may involve work outdoors in all kinds of weather.
- Work involves application of scientific theory to practical problems.
- Job satisfaction may come from being involved in preserving natural resources.

NEBRASKA EMPLOYMENT

About 399 forestry and conservation scientists are projected to be employed by 1991. Soil conservationists are part of this group.

WAGES

In Nebraska, forestry and soil conservation scientists with a minimum of a bachelors degree may expect an entry level salary between $15,000 and $27,000 a year depending on college grades and experience. Soil conservation scientists tend to start at slightly lower salaries than foresters with a range of $14,000 to $25,000 a year. Nationally, the entry level range for all forestry and soil conservation scientists varies considerably depending on the level of education completed and the level of responsibility. Entry level salaries range between $16,000 and $35,000 a year. Salaries tend to fall in the upper end of the scale for Federal Government employees.

Salaries in State and local government and in private industry tend to be at the lower end of the scale.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Unfavorable
Factors

- Majority of openings will result from the need to replace workers who retire or leave the career.
- Little change is expected in the number of conservationists employed by government agencies.
- Some openings will occur in banks and other organizations that make loans or have large agricultural holdings.

PREPARATION

SKILLS

- Knowledge of basic sciences, soil sciences, general agriculture, and soil classification.
- Skills in observation and problem solving.
- Skills in supervision and planning.
- Verbal skills to write reports and to communicate with public officials, landowners, and citizens groups.

TRAINING

- Minimum educational requirement is a bachelors degree in soil conservation or related subject such as agronomy, forestry, agricultural engineering, or wildlife biology.
- Graduate degrees are required for most research, teaching, and administrative positions
- Having agricultural work experience is helpful.
- Many jobs with state or federal agencies require passing a civil service exam.
- Summer Trainee Program of the Soil Conservation Service is offered by the U.S. Department of Agriculture to give college students on-the-job training.
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

111	Agricultural Production
113	Soil Sciences
118	Forestry and Natural Resources
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biological and physical sciences, chemistry, math through trigonometry, and agriculture.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 45.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 88

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
11902	Colorado State University
21507	Doane College
11907	Iowa State University
11908	Kansas State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
11922	University of Missouri-Columbia
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1853 AGRICULTURAL AND FOOD SCIENTISTS

OCCUPATIONAL DESCRIPTION

Agricultural and food scientists apply principles of physical and life sciences to protect, develop, and manage agricultural resources. They study farm crops and animals and develop ways of improving their quality and quantity. They look for ways to increase yields with less labor, control pests and weeds more effectively, and conserve soil and water. They improve the processing and use of foods.

HOLLAND CODES

IRS (Investigative, Realistic, Social)

SPECIALTIES

Agronomists (040.061-010) (18531)
Animal Scientists (040.061-014)
Dairy Scientists (040.061-018)
Horticulturists (040.061-038)
Poultry Scientists (040.061-042)
Soil Scientists (040.061-058) (18532)
Animal Breeders (041.061-014)
Entomologists (041.061-046)
Plant Breeders (041.061-082)
Food Technologists (041.081-010) (18533)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1845	Chemists
18521	Foresters
18522	Soil Conservationists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18543	Botanists
18544	Microbiologists
18545	Plant Pathologists
23901	County-Home Demonstration Agents
23902	Home Economists
23903	County-Agricultural Agents
2701	Veterinarians
3890	Science Technologists and Technicians
5512	General Farmers
5514	Livestock Farmers
5515	Horticultural Farmers

WORK ACTIVITIES

- Manage or administer research and development projects or marketing and production operations.
- Do research on the breeding, feeding, and diseases of domestic farm animals.
- Improve plant culture methods for the beautification of communities, homes, and parks and for increasing crop quality and yields.
- Study soil characteristics, map soil types, and determine the best types of crops for each soil.
- Breed plants to develop and improve their characteristics.
- Study insects and their relation to plant and animal life.
- Improve the development, production, processing, and use of foods.

APTITUDES

- Have ability to learn and apply a variety of scientific principles.
- Be able to use words in speaking, writing, and reading technical materials.
- Be able to give directions and work with people.
- Have ability to take responsibility and make decisions based on facts.
- Have good space, form, and color perception, ability to pay attention to detail, and good hand and finger dexterity.
- Be able to work within set standards and work independently.

WORK SETTING

Environment

Work indoors in offices and laboratories and outdoors at field sites.

Hours

Work 40 hours a week although hours may be irregular depending on employer.

Employers

Government agencies, educational institutions, agricultural service companies, nurseries, seed companies, tree farms, fertilizer companies, private research and consulting firms, food processing companies, and self-employed.

CONSIDERATIONS

- Outdoor work may be physically demanding.
- Some jobs may require travel or work in remote regions.
- Job involves application of theory to solve practical problems.
- Job satisfaction may come from working to increase food production to feed the world's growing population.

NEBRASKA EMPLOYMENT

About 724 agricultural and food scientists are projected to be employed by 1991.

WAGES

Entry level salaries for agricultural and food scientists vary widely depending on the amount of education completed and experience. In Nebraska, starting wages range from $17,000 to $25,000 a year for individuals with a bachelors degree. Persons with additional education and some experience will start at the upper end of the scale. Nationally, starting salaries in both the private sector and the Federal Government tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors

- Most openings will occur as workers retire or leave the occupation.
- Many agricultural and food scientists are supported by federal funding which is not expected to grow.
- Job opportunities in research in private industry may increase as advances are made in biotechnology.
- Job prospects are better for those with advanced degrees.

PREPARATION

SKILLS

- Knowledge and skills to apply scientific theories and data and to use research techniques.
- Ability to analyze data and produce oral and written technical reports.
- Skills in using many types of tools and laboratory equipment.
- Skills in supervising projects and people.
- Skills in problem solving and making decisions based on data.
- Ability to keep records.

TRAINING

- A bachelors degree in an agricultural science or a related field such as chemistry or biology is necessary.
- Advanced degrees are required for research, teaching, and administrative positions and by some employers.
- Previous work experience in the agricultural field is helpful.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

111	Agricultural Production
112	Animal Sciences
113	Soil Sciences
114	Food Sciences
115	Horticulture
123	Plant Sciences
524	Chemistry
531	Life Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biology, chemistry, physics, advanced math, agriculture, foods, computer science, and geography.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 44-47.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 85.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College

21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18531 AGRONOMISTS

OCCUPATIONAL DESCRIPTION

Agronomists conduct experiments to develop new methods of growing crops to get more efficient production, higher yield, and improved quality of food, feed, and fiber crops. They plan and carry out breeding studies at experiment stations or farms, and they determine the best methods of planting, cultivation, and harvesting and the effects of climate on crops. They develop methods for control of weeds, crop diseases, and pests. Some are employed in research and some teach. DOT 040.061-010

HOLLAND CODES

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1852	Forestry and Soil Conservation Scientists
18521	Foresters
18522	Soil Conservationists
18532	Soil Scientists
18533	Food Technologists
1854	Biological Scientists
18542	Biologists
18543	Botanists
18545	Plant Pathologists
23903	County-Agricultural Agents
5512	General Farmers
5515	Horticultural Farmers

WORK ACTIVITIES

- Perform research and develop principles and theories.
- Conduct field observations and carry out experiments.
- Map and classify soils.
- Identify problems in soil use and provide and manage solutions.
- Test new methods of production and control.
- Write and present technical reports and read scientific materials.
- Find new uses for established crops and grow new crops.
- Teach at colleges and universities.

APTITUDES

- Have ability to learn and apply a variety of scientific principles.
- Be able to use words in speaking, writing, and reading technical material.
- Be able to do mathematical calculations, keep records, and see detail.
- Have coordination of fingers and hands to do experiments.
- Be able to give directions and work with people.
- Be able to make decisions based on data and observation.

WORK SETTING

Environment

Work indoors in offices and laboratories and outdoors in fields.

Hours

Work 40 hours a week, but hours may be irregular depending on employers.

Employers

Government agencies; educational institutions; chemical, fertilizer, and seed companies; farm management agencies; private farm organizations; research labs and experiment stations; and consulting firms.

CONSIDERATIONS

- Working hours may be long and irregular.
- Job involves the application of theory to solving of practical problems.
- Often work as part of a team.

NEBRASKA EMPLOYMENT

About 724 agricultural and food scientists are projected to be employed by 1991. Agronomists are included in this group.

WAGES

Entry level salaries for agricultural and food scientists vary widely depending on the amount of education completed and experience. In Nebraska, starting wages range from $17,000 to $25,000 a year for individuals with a bachelors degree. Persons with additional education and some experience will start at the upper end of the scale. Nationally, starting salaries in both the private sector and the Federal Government tend to parallel those of Nebraska.

EMPLOYMENT OUTLOOK

Nebraska
 Somewhat Favorable
National
 Unfavorable
Factors

- Most openings will occur as workers retire or transfer to other occupations.
- Job opportunities for those with only a bachelors degree are limited.
- Application of biotechnology to agriculture may increase employment in research.
- Some opportunities are in third world and other foreign countries.

PREPARATION

SKILLS

- Knowledge of basic sciences, math, agronomy, agriculture, and computer science.
- Skills in observing, classifying, and interpreting data and drawing conclusions.
- Skills in producing clear technical reports in writing and speaking.
- Skills in managing and working with other people.

TRAINING

- A bachelor's degree in agronomy is the minimum educational requirement.
- An advanced degree is required for positions in research, for teaching in colleges and universities, and by many employers.
- Many jobs with state or federal agencies require passing a civil service exam.
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

111	Agricultural Production
113	Soil Sciences
123	Plant Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biological sciences, chemistry, advanced math, computer sciences, geography, and agriculture.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 44.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.) p. 85.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
22708	Southeast Community College-Beatrice Campus
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18532 SOIL SCIENTISTS

OCCUPATIONAL DESCRIPTION

Soil scientists study soil characteristics, map soil types, and investigate how soils respond to management practices. They advise persons on rural and urban land use. Some teach at college and universities. DOT 040.061.058

HOLLAND CODES

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1852	Forestry and Soil Conservation Scientists
18521	Foresters
18522	Soil Conservationists
18531	Agronomists
18533	Food Technologists
18541	Biochemists
18542	Biologists
23903	County-agricultural Agents
5512	General Farmers

WORK ACTIVITIES

- Study soil characteristics.
- Map soil types.
- Study responses of soil types to fertilizers, tillage practices, crop rotation, and other actions.
- Find best soil types for different plants.
- Analyze soil content to find relationships between chemicals and plant growth.
- Keep records and write technical reports.
- Give advice on land use.

APTITUDES

- Be able to learn principles of botany, chemistry, and soil sciences.
- Have strong verbal and math abilities for use in research, writing, and communicating with people.
- Have good space, form, and color perception and finger and hand dexterity.
- Be able to direct and coordinate projects.
- Be able to make decisions based on data, work within set standards, and work independently.

WORK SETTING

Environment
Work indoors in offices and laboratories, and outdoors at field sites.

Hours
Work 40 hours a week.

Employers
Government agencies, research laboratories, real estate and land development firms, chemical and fertilizer companies, land appraisal agencies, and consulting firms.

CONSIDERATIONS

- Work may involve exposure to all kinds of weather and extensive travel.
- Soil scientists often work closely with other scientists in related areas.
- Scientists usually specialize in one area such as soil fertility.

NEBRASKA EMPLOYMENT

About 724 agricultural and food scientists are projected to be employed by 1991. Soil scientists are included in this group.

WAGES

Entry level salaries for agricultural and food scientists vary widely depending on the amount of education completed and experience. In Nebraska, starting wages range from $17,000 to $25,000 a year for individuals with a bachelors degree. Persons with additional education and some experience will start at the upper end of the scale. Nationally, starting salaries in both the private sector and the Federal Government tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable

National
Somewhat Favorable

Factors
- Growing interest in development of new food sources should increase opportunities.

- Long-range surveying projects by the U.S. Department of Agriculture should also create openings.

PREPARATION

SKILLS

- Knowledge of agronomy, botany, chemistry, physics, math, and computer and soil sciences.
- Skills in problem solving, analysis, and research methods.
- Skills in communicating with people at all levels.
- Ability to write detailed technical reports and keep records.

TRAINING

- A bachelors degree in agronomy or soil science is the minimum educational requirement.
- An advanced degree is required for teaching and most research positions.
- Many jobs with state or federal agencies require passing a civil service exam.
- Having agricultural work experience is helpful.
- Summer Trainee Program of the Soil Conservation Service is offered by the U.S. Department of Agriculture to give college students on-the-job training.

EDUCATIONAL PROGRAM

111	Agricultural Production
113	Soil Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biological and earth sciences, chemistry, physics, advanced maths, compute science, agriculture, and geography.

BIBIOLOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 45.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 85.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
22708	Southeast Community College-Beatrice Campus
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18533 FOOD TECHNOLOGISTS

OCCUPATIONAL DESCRIPTION

Food technologists apply scientific and engineering principles to the development, production, processing, and use of foods. They check for food safety and develop new food products. Some specialize in food distribution and study methods of maintaining the quality of food during shipment and storage. Others work as quality control or government inspectors. Others teach, do research, write technical and educational materials, or serve as consultants. DOT 041.081-010

HOLLAND CODES

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
18531	Agronomists
18532	Soil Scientists
1854	Biological Scientists
18541	Biochemists
18544	Microbiologists
18545	Plant Pathologists
23901	County Home-Demonstration Agents
23902	Home Economists
3020	Dietitians
3890	Science Technologists and Technicians

WORK ACTIVITIES

- Conduct basic and new product research.
- Develop new methods and systems for food processing, production, quality control, packaging, and distribution.
- Study methods to improve qualities of foods.
- Develop and enforce food and safety standards.
- Test new products.
- Write articles for magazines and journals.
- Prepare technical and educational materials.
- Serve as consultants.
- May specialize in one phase of food technology such as quality coltrol.

APTITUDES

- Be able to learn and apply principles of biology, chemistry, and food technology.
- Have good verbal and math abilities for use in research and writing.
- Have good space, form, and color perception, ability to pay attention to details, and good hand and finger dexterity.
- Be able to handle a variety of activities and make decisions based on data.
- Be able to work within set standards and precise measurements.

WORK SETTING

Environment

Work indoors in offices, laboratories, and production areas.

Hours

Work 40 hours a week.

Employers

Dairy plants, meat packing houses, canneries, frozen food processors, bakeries, other food processing companies, federal and state government agencies, educational institutions, and self-employed.

CONSIDERATIONS

- Workers in food processing areas may be exposed to noisy, hot, or cold working conditions.
- People in this field may experience personal satisfaction from being involved in research that helps solve world food problems.

NEBRASKA EMPLOYMENT

About 741 biological, agricultural, and food technicians are projected to be employed by 1991. Food technologists are included in this group.

WAGES

Entry level salaries for agricultural and food scientists vary widely depending on the amount of education completed and experience. In Nebraska, starting wages range from $17,000 to $25,000 a year for individuals with a bachelors degree. Persons with additional education and some experience will start at the upper end of the scale. Nationally, starting salaries in both the private sector and the Federal Government tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Somewhat Favorable
Factors

- Some new openings will be available as a result of the continuing need to supply nutritional diets for the world's growing population.
- Job openings will occur to replace present workers who retire or leave their jobs.

PREPARATION

SKILLS

- Knowledge of biology, chemistry, and soil and food sciences.
- Skills in research methods, problem solving, development techniques, and technical writing and speaking.
- Ability to supervise workers, analyze production methods, and make decisions based on data.
- Ability to get along with people.

TRAINING

- The minimum educational requirement is a bachelors degree in food science or some related science like biology or chemistry.
- Advanced degrees are necessary for most research, teaching, and supervisory positions.
- Most graduate students specialize in one area of food technology.
- Those with only a bachelors degree may start as quality control workers or assistant production managers.

EDUCATIONAL PROGRAM

114	Food Sciences
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in advanced math, biology, chemistry, physics, and foods.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 47.

Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.

Occupational Outlook Handbook (1990-91 ed.), p. 85.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1854 BIOLOGICAL SCIENTISTS

OCCUPATIONAL DESCRIPTION

Biological scientists study living organisms and their relationship to the environment. Many are involved in research and development. They do research to gain information about living things that can be used to solve problems in medicine, industry, and agriculture. They often use complex research methods and lab equipment. Others do consulting work, teach, write for technical journals, or test and inspect foods, drugs, and other products.

HOLLAND CODES

IRS (Investigative, Realistic, Social)

SPECIALTIES

Biochemists (041.061-026) (18541)
Biologists (041.061-030) (18542)
Botanists (041.061-038) (18543)
Geneticists (041.061-050)
Microbiologists (041.061-058) (18544)
Physiologists (041.061-078)
Plant Pathologists (041.061-086) (18545)
Staff Toxicologists (041.061-094)
Zoologists (041.061-090)
Military Life Scientists (M18540)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1843	Physicists
1845	Chemists
1852	Forestry and Conservation Scientists
18521	Foresters
1853	Agricultural and Food Scientists
18531	Agronomists
18533	Food Technologists
1855	Medical Scientists
26101	Pathologists
2701	Veterinarians
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians
36904	Sanitarians
3820	Biological Technologists and Technicians
3890	Science Technologists and Technicians

WORK ACTIVITIES

- Conduct research to increase knowledge of living organisms.
- Use results of research to develop new medicines, increase crop yields, and improve the environment.
- Work in laboratories using lab equipment and computers.
- Work outside of labs in field testing stations.
- Plan and administer research and test projects.
- Work as a consultant or inspector.
- Write for technical publications.
- Work in sales or service jobs.
- May teach.

APTITUDES

- Be able to learn biological concepts, complex math, chemistry, and computer science.
- Have high verbal abilities to understand and write technical materials and explain complex ideas.
- Be able to visualize objects from descriptions and to see slight differences in objects.
- Be able to do precise work and make decisions based on facts.
- Have patience and perseverance.
- Be able to get along with others.

WORK SETTING

Environment
Work indoors in offices or laboratories and outdoors at field sites.
Hours
Work 40 hours a week with some longer hours possible.
Employers
Educational institutions, industries, research organizations, hospitals, government agencies, and self-employed.

CONSIDERATIONS

- May conduct research in remote areas.
- Biologists work independently and as part of a team.
- Job may offer satisfaction by improving the environment, doing medical research, or increasing the food supply.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to be employed by 1991.

WAGES

Entry level salaries for all biological scientists vary widely depending on education, and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the Federal Government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Growth is due to advances in genetic research that should result in new drugs, improved plants, and medical discoveries.
- Efforts to preserve the environment should also result in growth.
- Those with advanced degrees will find better employment opportunities.

PREPARATION

SKILLS

- Knowledge of scientific theories, computer science, complex math, and research techniques.
- Skills in report writing and presenting oral reports.
- Skills in planning and supervising.
- Skills in decision making and problem solving.

TRAINING

- A bachelor's degree is the minimum educational requirement for beginning positions such as research assistants or technicians.
- An advanced degree is required for most college teaching, research, and administrative positions.

EDUCATIONAL PROGRAM

123	Plant Sciences
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in earth science, biology, chemistry, physics, advanced math, geography, health, agricultural production, computer science, and composition.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 177), pp. 46-47.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed), p. 86
Military Career Guide (1988-89 ed.), p. 305.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18541 BIOCHEMISTS

OCCUPATIONAL DESCRIPTION

Biochemists study the chemical makeup of living things. They study the complex chemical combinations and reactions involved in metabolism, reproduction, growth, and heredity. DOT 041.061-026

HOLLAND CODES

CRS (Conventional, Realistic, Social)

NCIS RELATED OCCUPATIONS

1845	Chemists
18521	Foresters
18522	Soil Conservationists
1853	Agricultural and Food Scientists
18532	Soil Scientists
18533	Food Technologists
1854	Biological Scientists
18542	Biologists
18543	Botanists
18544	Microbiologists
18545	Plant Pathologists
1855	Medical Scientists
26101	Pathologists
3620	Clinical Laboratory Technologists
3820	Biological Technologists and Technicians

WORK ACTIVITIES

- Conduct research to determine action of substances on tissues and processes of living organisms.
- Isolate, analyze, and identify hormones, vitamins, allergens, minerals, and enzymes, and determine effects on body functions.
- Study chemistry of living processes.
- Develop new medications.
- Prepare medications for commercial distribution.

APTITUDES

- Be able to learn complex math, chemistry, physics, biology, biochemistry, and research techniques.
- Have strong verbal abilities to read and write technical materials.
- Have good space and form perception.
- Be able to pay attention to small details.
- Be able to handle paperwork, make decisions based on data, and work within set standards and precise measurements.
- Be able to work independently and as part of a team.

WORK SETTING

Environment
: Work indoors in offices, laboratories, and production areas.

Hours
: Work 40 hours a week.

Employers
: Government agencies, industries producing chemical products, research firms, and educational institutions.

CONSIDERATIONS

- Patience is a needed quality.
- Workers may experience personal satisfaction from furthering medical research.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to be employed by 1991. Biochemists are included in this group.

WAGES

Entry level salaries for all biological scientists vary widely depending on education, and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the federal government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable

Factors

- Biochemistry's impact upon other disciplines has increased job opportunities.
- Cut backs in government funding have limited some research projects.
- New discoveries in biotechnology will provide opportunities for some.
- Growth in this field may result from efforts to find cures for diseases such as cancer.

PREPARATION

SKILLS

- Knowledge of math, biology, chemistry, biochemistry, physics, and research techniques.
- Skills in use of laboratory equipment.
- Skills in problem solving.
- Skills in writing and reading technical materials and recordkeeping.

TRAINING

- The minimum educational requirement is a bachelors degree in biochemistry or biology or chemistry with course work in biochemistry.
- Advanced degrees are necessary for most positions including research, teaching, and administration of projects.
- Those with bachelors degrees may find positions as research assistants and technicians.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

524	Chemistry
531	Life Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biology, chemistry, physics, computer science, health, algebra, geometry, trigonometry, and composition.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 46.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 86.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18542 BIOLOGISTS

OCCUPATIONAL DESCRIPTION

Biologists study the basic life processes common to all living organisms including plants, animals, and humans. They examine the origin, relationship, development, anatomy, functions, and other basic principles of plant and animal life. Some may specialize in research centering around a particular aspect of biology. Others may determine environmental effects of land and water use and prepare environmental impact reports. Others may teach. DOT 041.061-030

HOLLAND CODES

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

1845	Chemists
1852	Forestry and Soil Conservation Scientists
18521	Foresters
1853	Agricultural and Food Scientists
18531	Agronomists
18532	Soil Scientists
1854	Biological Scientists
18541	Biochemists
18543	Botanists
18544	Microbiologists
18545	Plant Pathologists
1855	Medical Scientists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians
36904	Sanitarians
3820	Biological Technologists and Technicians
5720	Forestry Workers

WORK ACTIVITIES

- Do research and interpret and analyze the results of their research.
- Do precision work in labs and at test sites.
- Write and publish reports and impact statements.
- Plan and supervise projects.
- Confer and work with other scientists.
- Use computers to store and process data.
- May teach.

APTITUDES

- Be able to learn principles of biology and research techniques.
- Have high verbal ability to read technical materials, explain complex concepts, and write reports and articles.
- Have high math ability to design and do research experiments.
- Be able to visualize space and form relationships.
- Be able to record data, make decisions based on data and observation, and pay attention to precise details.

WORK SETTING

Environment

Work indoors in offices and laboratories and outdoors in field research settings.

Hours

Work 40 hours a week with some longer hours possible.

Employers

Educational institutions, research organizations, private industries, hospitals, government agencies, and self-employed.

CONSIDERATIONS

- Some research work may expose workers to hazards.
- Researchers often work closely with other members of a team.
- Workers may experience job satisfaction from protecting the enviornment.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to be employed by 1991. Biologists are included in this group.

WAGES

Entry level salaries for all biological scientists vary widely depending on education, and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the federal government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors

- People with advanced degrees will find better job opportunities.
- Employment in biology may grow because of increased interest in preserving the environment and in medical research.
- High school teaching opportunities are currently good in the life sciences.
- Many opportunities depend on government funding.

PREPARATION

SKILLS

- Knowledge of biological principles, research techniques, computer science, math, and chemistry.
- Ability to apply scientific theories to practical issues.
- Skills in problem solving and decision making.
- Skills in using lab equipment and recording data.
- Ability to work independently or on a team.

TRAINING

- A bachelors degree in biology or life sciences is the minimum educational requirement and is acceptable for some jobs such as technician or health inspector positions.
- Advanced degrees are necessary for most jobs such as college-level teaching, research, and administrative positions.

EDUCATIONAL PROGRAM

531 Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in biology, chemistry, any other life sciences, advanced math, computer science, health, geography, agricultural production, and composition.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 46.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 86.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18543 BOTANISTS

OCCUPATIONAL DESCRIPTION

Botanists deal primarily with plants and their environment. Some study all aspects of plant life, while others specialize in areas such as identification and classification of plans, the structure and function of plant parts, the biochemistry of plant processes, and the courses and cures of plant diseases. Some are employed as teachers. DOT 041.061-038

HOLLAND CODES

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1852	Forestry and Soil Conservation Scientists
18521	Foresters
1853	Agricultural and Food Scientists
18531	Agronomists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18545	Plant Pathologists
3820	Biological Technologists and Technicians
5515	Horticultural Farmers
5720	Forestry Workers

WORK ACTIVITIES

- Conduct field studies and laboratory experiments and analyze the results.
- Study work of other scientists.
- Develop new theories, processes, and equipment.
- Use a variety of equipment.
- Prepare reports and write articles for publication.
- Plan scientific projects, determine work schedules, and act as coordinators.
- Identify and classify plants.
- May teach.

APTITUDES

- Be able to learn scientific theories of botany and research techniques.
- Have high verbal ability to understand technical materials, explain concepts, and write reports and articles.
- Have math ability to design and do experiments.
- Be able to visualize space and form relationships.
- Be able to record data, make decisions based on data and observation, and pay attention to precise details.
- Have manual dexterity to use lab equipment.

WORK SETTING

Environment

Work indoors in offices, laboratories, and greenhouses and outdoors in field research settings.

Hours

Work 40 hours a week with longer hours possible.

Employers

Educational institutions, government agencies, industries, research organizations, agricultural organizations, botanical gardens, museums, and magazines.

CONSIDERATIONS

- Job may involve work outdoors in all kinds of weather.
- Researchers often work as apart of a team.
- Occupation offers opportunity to contribute to scientific advancement.
- Field of botany is broad with many possible specializations.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to be employed by 1991. Botanists are included in this group.

WAGES

Entry level salaries for all biological scientists vary widely depending on education and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the federal government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- People with advanced degrees will have better job opportunities.
- Many jobs rely upon government funding.
- Employment in botany is expected to grow with increased interest in preserving the environment and the need to develop new food sources.

PREPARATION

SKILLS

- Knowledge of botanical principles, classification systems, computer science, and research techniques.
- Ability to apply scientific theory to practical problems.
- Skills in using laboratory equipment.
- Skills in administration, problem solving, and decision making.
- Skills in report writing and presentation.

TRAINING

- A bachelor's degree in biology or life sciences with emphasis in botany is the minimum educational requirement and is acceptable for some beginning jobs such as technicians or greenhouse workers.
- Advanced degrees are necessary for most postions including research and college-level teaching.
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

123	Plant Sciences
531	Life Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in earth science, biology, chemistry, advanced math, geography, agricultural production, computer science, and composition.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 46.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-91 ed.), p. 86.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18544 MICROBIOLOGISTS

OCCUPATIONAL DESCRIPTION

Microbiologists investigate the growth and characteristics of microscopic organisms such as bacteria, viruses, and molds. They may also study the relationship between bacteria and disease or the effect of antibodies on bacteria. Some teach. DOT 041.062-058

HOLLAND CODES

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1853	Agricultural and Food Scientists
18533	Food Technologists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18545	Plant Pathologists
1855	Medical Scientists
26101	Pathologists
3620	Clinical Laboratory Technologists
3890	Science Technologists

WORK ACTIVITIES

- Isolate and make cultures of micro-organisms.
- Identify micro-organisms by examination with a microscope and observe their action upon living and dead tissues.
- Make chemical analysis of substances produced by micro-organisms.
- Prepare reports and write technical articles.
- Perform lab tests for use in medical diagnosis or treatment.
- Plan and supervise research projects.
- May teach.

APTITUDES

- Be able to learn the principles of microbiology and research techniques.
- Have high verbal ability to understand technical materials, explain scientific theories, and write reports and articles.
- Have good space and form perception and be able to see detail.
- Be able to organize research projects, make decisions based on data and visual observation, and work according to exact standards.
- Have good numerical abilities.

WORK SETTING

Environment
 Work indoors in offices or laboratories.
Hours
 Work 40 hours a week with longer hours possible.
Employers
 Hospitals, medical schools, government agencies, drug companies, industries, research organizations, educational institutions, and medical laboratories.

CONSIDERATIONS

- Some microbiologists may be exposed to hazards.
- Medical microbiologists may receive job satisfaction by helping medical research progress.
- Microbiologists may work in a wide variety of work settings or activity areas.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to be employed by 1991. Microbiologists are part of this group.

WAGES

Entry level salaries for all biological scientists vary widely depending on education and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the federal government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
 Favorable

National
Somewhat Favorabe
Factors

- Expansion of the chemical and nuclear industries, concern with environmental issues, and the needs in medical research should add to the demand for microbiologists.

PREPARATION

SKILLS

- Knowledge of microbiology, chemistry, math, computer science, and research techniques.
- Knowledge of medical terms.
- Skills in using laboratory equipment.
- Skills in reading and writing technical reports.
- Ability to apply scientific theory to problem solving and decision making.
- Skills in supervision and planning.

LICENSING OR CERTIFICATION

- Certification may be obtained through the National Registry of Microbiologists sponsored by the American Society of Microbiology although it is not required.
- Certification requirements include completing specified education and experience requirements and passing a series of exams.

TRAINING

- A bachelors degree is the minimum educational requirement and is adequate for beginning jobs such as laboratory technician or scientific assistant.
- Advanced degrees are necessary for most positions in microbiology including college teaching and research.

EDUCATIONAL PROGRAM

531 Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including biology, chemistry, physics, advanced math, health, computer science, and composition.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 46-47.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.
Occupational Outlook Handbook (1990-90 ed.), p. 86.

SCHOOLS

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22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

18545 PLANT PATHOLOGISTS

OCCUPATIONAL DESCRIPTION

Plant pathologists conduct research in the nature, cause, and control of plant diseases and decay of plant products. DOT 041.061-086

HOLLAND CODES

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1853	Agricultural and Food Scientists
18531	Agronomists
18533	Food Technologists
18541	Biochemists
18542	Biologists
18543	Botanists
18544	Microbiologists
3820	Biological Technologists and Technicians

WORK ACTIVITIES

- Observe symptoms, examine diseased tissues, and apply diagnostic techniques to identify plant diseases.
- Use laboratory and research equipment.
- Consult technical and scientific publications and other scientists.
- Determine cause of diseases through research, observation, and past experience.
- Plan methods of treating, controlling, and eliminating diseases.
- Use computer to predict outbreaks of plant diseases.
- Speak to groups and individuals.
- Write technical reports and articles.

APTITUDES

- Be able to learn and apply the principles of plant pathology and research techniques.
- Have high verbal ability to understand technical materials, write reports, and explain scientific ideas.
- Have good space and form perception and ability with numbers.
- Be able to plan and coordinate research projects, make decisions based on data, and work with precise details.
- Have good finger and hand dexterity and coordination.
- Have patience and perseverance.

WORK SETTING

Environment
Work indoors in offices, laboratories, and greenhouses and outdoors in field settings.

Hours
Work 40 hours a week with longer hours possible.

Employers
Government agencies, educational institutions, agricultural experiment stations, plant growers, botanical gardens and arboretums, industries and research organizations.

CONSIDERATIONS

- Job may involve work outdoors in all kinds of weather.
- Researchers may work as part of a team.
- Plant pathology is a highly specialized field with many areas of application.

NEBRASKA EMPLOYMENT

About 295 biological scientists are projected to employed by 1991. Plant pathologists are included in this group.

WAGES

Entry level salaries for all biological scientists vary widely depending on education and experience. Biological scientists with a bachelors degree employed in private industry or research institutions as research technicians average between $18,000 and $22,000 a year. Individuals with graduate degrees average between $22,000 and $35,000 a year depending on academic records or work experience. Starting salaries for biological scientists employed by the federal government tend to be slightly lower than those employed in private industry or research institutions.

EMPLOYMENT GROWTH

Nebraska
Favorable

National
Somewhat Favorable
Factors

- Employment in plant science will continue to grow because of the increasing importance of food production to help solve the problems of world hunger.
- People with advanced degrees will have the best opportunities.

PREPARATION

SKILLS

- Knowledge of plant pathology, botany, math, computer science, and research techniques.
- Skill in using laboratory and research equipment.
- Ability to apply scientific theory to practical issues.
- Skill in technical writing and explaining complex ideas.
- Skill in problem solving, decision making, supervising, and planning.
- Ability to work with others.

TRAINING

- A bachelors degree in plant pathology, botany, or life science is the minimum educational requirement for beginning positions such as research assistants or technicians.
- An advanced degree in plant pathology either from a life science or agricultural department is required for most college teaching, research, and administrative positions.

EDUCATIONAL PROGRAM

123	Plant Sciences
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in advanced math, biology, chemistry, agricultural production, composition, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 47.

Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1855 MEDICAL SCIENTISTS

OCCUPATIONAL DESCRIPTION

Medical scientists conduct research to develop cures for health problems. They study the make-up of cells, tissue, and organs and the effects of viruses, bacteria, drugs, and other agents on them.

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Anatomists (041.061-010)
Histopathologists (041.061-054)
Parasitologists (041.061-070)
Pharmacologists (041.061-074)
Public-Health Microbiologists (041.261-010)

NCIS RELATED OCCUPATIONS

1843	Physicists
1845	Chemists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18544	Microbiologists
2610	Physicians
26101	Pathologists
3010	Pharmacists
3620	Clinical Laboratory Technologists
36903	Medical Laboratory Technicians
3820	Biological Technologists and Technicians
3890	Science Technologists

WORK ACTIVITIES

- Study cells, tissue, and organs through observation, dissection, and examination using a microscope.
- Study damaged or destroyed parts and determine possibility of transplants.
- Provide data on cause and progress of disease.
- Train and supervise laboratory personnel.
- Write diagnostic reports.
- Study animal parasites and develop methods and agents to combat them.
- Standardize procedures for manufacture of medicines.
- Analyze results of research.
- Inoculate people against contagious diseases.

APTITUDES

- Be able to learn complex math, chemistry, biology, scientific principles, research techniques, and computer science.
- Have strong verbal abilities to read technical materials, write reports, and explain complex concepts.
- Have strong space, form, and color perception and good hand and finger dexterity.
- Be able to pay attention to fine details, make decisions based on observation and data, and work within precise measurements and set standards.
- Have patience, creativity, and ability to handle disappointment.

WORK SETTING

Environment

Work indoors in offices and laboratories.

Hours

Work 40 hours a week with longer hours possible to complete projects or attend meetings.

Employers

Educational institutions, government agencies, manufacturing companies, hospitals, and research centers.

CONSIDERATIONS

- Workers may receive personal satisfaction from furthering medical research.
- Researchers may work independently or as part of a team.
- Some research projects include experiments on animals.

NEBRASKA EMPLOYMENT

About 87 medical scientists are projected to be employed by 1991.

WAGES

Entry level salaries for medical scientists with a masters degree range between $17,000 and $22,000 a year depending on academic records and level of responsibility. Individuals with an earned doctorate may start within a range of $22,000 to $35,000 a year. Starting wages outside of Nebraska tend to be slightly higher with a top range of $38,000 to $40,000 a year depending on the size and location of the employer and academic background, experience and level of responsibility.

EMPLOYMENT OUTLOOK

Nebraska
Favorable
National
Favorable
Factors

- Desire to find cures for diseases such as cancer and concern for new government regulations should create new jobs in this field.

PREPARATION

SKILLS

- Knowledge of complex math, statistics, medical sciences, chemistry, computer science, and research techniques.
- Skills in scientific writing and speaking.
- Skills in problem solving, analyzing, decision making, and supervising.

TRAINING

- The minimum educational requirement is an advanced degree with emphasis in medicine, pharmacy, or life sciences and specialization in a chosen area such as parasitology and pharmacology.

EDUCATIONAL PROGRAM

363	Medicine
372	Pharmacy
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, biology, chemistry, health, computer science, and composition

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 46-47.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1912 ECONOMISTS

OCCUPATIONAL DESCRIPTION

Economists study how people use resources such as land, raw materials, manpower, and machinery to provide goods and services. They analyze the costs and benefits of making, distributing, and using resources in a particular way. They may study problems such as inflation and recession. Most apply their skills to solve problems in a certain areas such as financc labor, agriculture, or health. DOT 050.067-010

HOLLAND CODES

ISA (Investigative, Social, Artistic)

SPECIALTIES

Market-Research Analysts I (050.067-014) (19121)

NCIS RELATED OCCUPATIONS

1220	Financial Managers
1412	Accountants and Auditors
1414	Underwriters
1415	Loan Officers
1732	Actuaries
1733	Statisticians
1739	Mathematicians
1920	Urban and Regional Planners

WORK ACTIVITIES

- Plan methods and procedures for collecting and processing data.
- Collect, process, and analyze data and write reports.
- Develop recommendations and policies to solve economic problems.
- Give advice to business firms, banks, labor unions, and the government.
- May teach.

APTITUDES

- Have ability to understand economic theory.
- Have good verbal abilities to understand economic literature, write reports, and communicate with people about economic issues.
- Have good math abilities to interpret statistical data and conduct research activities.
- Be able to record information accurately, work with exact details, and make decisions based on data and experience.
- Be able to think abstractly.

WORK SETTING

Environment
  Work indoors in offices.
Hours
  Work 40 hours a week with longer hours possible.
Employers
  Industries, manufacturing firms, banks, insurance companies, educational institutions, government agencies, business firms, consulting firms, and research organizations.

CONSIDERATIONS

- Economists make decisions that affect others lives.
- This job often carries prestige.

NEBRASKA EMPLOYMENT

About 328 economists and marketing analysts are projected to be employed by 1991.

WAGES

In Nebraska, economists with a bachelors degree in economics receive an average starting salary of between $22,000 and $30,000 a year depending on college records and area of specialization. National salary figures parallel those of Nebraska with slight variances depending on geographic location. Economists in general administration and international economics tend to command the highest salaries. Entry level salaries in the Federal Government tend to be somewhat lower with a starting range of between $18,000 and $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
  - Economists in business and industry are in increasing demand.

- Opportunities in colleges and universities are not expected to increase rapidly.
- Those with advanced degrees will find the best job opportunities.

PREPARATION

SKILLS

- Knowledge of economic theory and computer science.
- Ability to collect, analyze, and interpret data and use statistical methods.
- Skills in speaking and writing.
- Skills in planning and supervising.
- Ability to reason abstractly.

TRAINING

- A bachelors degree is the minimum educational requirement and is acceptable for some beginning research and management positions.
- Most professional and college teaching positions require an advanced degree in a specialized area of economics such as social policy, urban economics, or public financing.

EDUCATIONAL PROGRAM

132	City, Community, and Regional Planning
581	Social Sciences
583	Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, history, government, economics, sociology, geography, computer science, composition and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 50.

Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535 and 546-549.

Occupational Outlook Handbook (1990-91 ed.), p. 103.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

19121 MARKET-RESEARCH ANALYSTS I

OCCUPATIONAL DESCRIPTION

Market-research analysts compile information that companies use to make decisions on their products and services. In the consumer field, they study the buying public and their wants and needs. Industrial marketing emphasizes the current and future needs of industry and government as consumers. In both areas, analysts present their findings in written reports summarizing their conclusions, making recommendations, and proposing alternative courses of action. DOT 050.067-014

HOLLAND CODES

ISC (Investigative, Social, Conventional)

NCIS RELATED OCCUPATIONS

1250	Marketing and Advertising Managers
1414	Underwriters
1442	Wholesale and Retail Buyers
1732	Actuaries
1733	Statisticians
1739	Mathematicians
1912	Economists
1916	Sociologists
1920	Urban and Regional Planners

WORK ACTIVITIES

- Develop research methods and design questionnaires for gathering data.
- Gather and study data to predict future marketing trends.
- Prepare reports and illustrations of findings.
- Make recommendations and propose alternative courses of action in writing or orally conduct interviews.
- Study trade journals, government reports, and financial publications.

APTITUDES

- Be able to learn principles of business, math, and market research.
- Have good verbal and math abilities to use in collecting, analyzing, and explaining data.
- Be able to do detailed paperwork, keep accurate records, and see important detail in verbal or numerical materials.
- Be able to work well with people.
- Be able to make decisions based on data observations, and experience.
- Be able to solve problems objectively.
- Be creative and patient.

WORK SETTING

Environment
    Work indoors in offices.
Hours
    Work 40 hours a week with some longer hours to meet deadlines.
Employers
    Manufacturing companies, advertising agencies, stores, radio and television stations, newspapers, research centers, government agencies, management and consulting firms, telephone companies, and independent consultants.

CONSIDERATIONS

- Market researchers usually work with others as a member of a team.
- Some workers travel frequently.

NEBRASKA EMPLOYMENT

About 328 economists and marketing analysts are projected to be employed by 1991. Market-research analysts are included in this group.

WAGES

In Nebraska, market-research analysts with a bachelors degree in marketing or statistics receive an average entry level salary of between $19,000 and $27,500 a year depending on college records. The starting salary range for analysts nation wide parallels Nebraska salaries. Recent graduates with superior academic records will command the highest salaries in this competitive field. Many market-research analysts with a masters degree have additional income from teaching positions in junior and community colleges.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Very Favorable

Factors

- Employment in this field depends largely on economic conditions.
- Population growth and increased variety in goods and services will mean more analysts will be needed.
- People with graduate degrees will have the best opportunities.

PREPARATION

SKILLS

- Knowledge of marketing, computer science, statistics, and economics.
- Skills in collection, analysis, and interpretation of research data.
- Skills in oral and written communication and reading and writing technical materials.
- Skills in supervision and dealing with people.

TRAINING

- A bachelors degree in marketing or statistics is the minimum educational requirement for trainee positions.
- An advanced degree in marketing, business administration, statistics, or some other closely related field is usually needed for specialized positions within marketing.

EDUCATIONAL PROGRAM

132	City, Community, and Regional Planning
143	Banking and Financing
145	Business Administration
146	Marketing
481	Mathematics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in advanced math, economics, sociology, psychology, business law, merchandising and marketing, computer science, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 50.
Guide for Occupational Exploration (2nd ed., 1984), pp. 546-549.
Occupational Outlook Handbook (1990-91 ed.), p. 103.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

1915 PSYCHOLOGISTS

OCCUPATIONAL DESCRIPTION

Psychologists study the behavior of individuals and groups to understand and explain their actions and to help solve or prevent individual or group problems. They use lab experiments, tests, interviews, case histories, observation, and surveys to gather information about the way people think and behave. They may conduct training sessions, do market research, help disturbed patients, and design human-machine systems. Most work in schools and universities where they teach, counsel, and do research.

HOLLAND CODES

ISE (Investigative, Social, Enterprising)

SPECIALTIES

Developmental Psychologists (045.061-010)
Experimental Psychologists (045.061-018)
Educational Psychologists (045.067-010)
Social Psychologists (045.067-014)
Clinical Psychologists (045.107-022)
Counseling Psychologists (045.107-026)
Industrial-Organizational Psychologists (045.107-030)
School Psychologists (045.107-034)
Military Psychologists (M19150)

NCIS RELATED OCCUPATIONS

1230	Personnel Managers
2032	Social Workers
2042	Clergy Members
2401	Vocational and Educational Counselors
26107	Psychiatrists

WORK ACTIVITIES

- Administer, score, and interpret psychological tests.
- Observe individual or group behavior.
- Provide psychotherapy or counseling or administer other procedures to help people correct problems.
- Help schools provide better teaching programs.
- Apply psychological techniques to industrial problems.
- Plan, design, and conduct experiments in psychology and analyze the results.
- Teach.

APTITUDES

- Be able to learn complex math, sciences, and theories and methods of psychology.
- Have strong verbal abilities to use in reading, writing, research, and speaking.
- Have good math ability to do research and testing.
- Be able to work with a wide variety of people.
- Be able to make decisions based on data, experience, and observation.
- Be able to persuade people and handle a variety of activities.
- Have patience and be objective.

WORK SETTING

Environment

Work indoors in offices, laboratories, clinic areas, classrooms, or production areas.

Hours

Work 40 hours a week; schedules may be flexible and include evening and weekend hours.

Employers

Educational institutions, government agencies, nursing homes, clinics, hospitals, correctional institutions, rehabilitation centers, research organizations, business firms, manufacturing companies, residential treatment centers, and self-employed.

CONSIDERATIONS

- Work may be rewarding because it involves helping people and contributing to a greater understanding of human behavior.
- Psychologists may have interruptions in their schedules and heavy work loads.
- Work with many kinds of people some of whom may be uncooperative.
- Travel may be involved in this job.

NEBRASKA EMPLOYMENT

About 519 psychologists are projected to be employed by 1991.

WAGES

Starting salaries for psychologists who have earned a doctorate or a masters degree plus at least five years professional experience vary widely according to the nature of employment.

Psychologists in private practice and in applied specialties generally have higher earnings than educational, or government employed psychologists working in public institutions. In Nebraska, the average starting salary range for all psychologists is $27,622 to $42,619 a year. Outside Nebraska, salaries tend to parallel those of Nebraska. Entry level salaries in the Federal Government tend to be somewhat lower than Nebraska.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- Public concern for developing human resources, maintaining good mental health, and studying the effects of technological advances on people may add to the need for psychologists.
- Many health insurance companies will now pay for counseling treatment which may increase the demand for these workers.

PREPARATION

SKILLS

- Knowledge of research methods, principles of psychology, testing and evaluation methods, and human behavior.
- Skills in diagnosis and treatment of psychological problems.
- Skills in technical writing, speaking, training methods, and interviewing.
- Ability to work with people.

LICENSING OR CERTIFICATION

- Psychologists must be licensed by the State Board of Examiners of Psychologists to be able to practice.
- To become licensed, a person must have a doctorate degree in psychology from an accredited college or university, pass an exam, and meet certain work experience requirements.
- School psychologists must be certified by the State Department of Education to practice in Nebraska schools.
- To become certified, a person must complete a masters degree in school psychology, including a minimum of 60 semester hours and 1,000 clock hours of supervised field experience.

TRAINING

- The minimum educational requirement is a doctorate in psychology except in school psychology where it is a masters degree.
- Specialization in a specific field such as clinical or industrial psychology is helpful.
- People with a masters degree in psychology may qualify as psychological assistants.

EDUCATIONAL PROGRAM

141	Human Resources Development
238	Counseling
392	Indvidual and Family Development
541	Psychology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, biology, sociology, psychology, health, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles(4th ed.,1977) pp. 48-49.
Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512 and 532-535.
Occupational Outlook Handbook(90-91 ed)p105.
Military Career Guide (1988-89 ed.), p. 281.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
21715	Peru State College
22708	Southeast Community College-Beatrice
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1916 SOCIOLOGISTS

OCCUPATIONAL DESCRIPTION

Sociologists study the behavior and relationship of groups formed by people such as families, tribes, communities, and states. They trace their beginning and growth and try to understand the influence these groups have on people. Most conduct research, do consulting work, and/or teach. DOT 054.067.014

HOLLAND CODES

EIS (Enterprising, Investigative, Social)

SPECIALTIES

Social Welfare Research Workers (054.067-010)
Clinical Sociologists (054.107-010)

NCIS RELATED OCCUPATIONS

1733	Statisticians
19121	Market-Research Analysts I
1919	Social Scientists
19191	Anthropologists
1920	Urban and Regional Planners
2032	Social Workers
20322	Probation Officers

WORK ACTIVITIES

- Determine type of data needed and how and where it can be obtained.
- Analyze and evaluate collected data, compile it into usable form, and arrive at theoretical or problem-solving conclusions.
- Carry out intervention work at the individual, group, organization, community, and/or society levels.
- Coordinate activities and functions related to the operation of a social science organization or foundation.
- Provide advice and services.
- Teach and prepare publications.

APTITUDES

- Have ability to learn sociological theory and research techniques.
- Have high verbal abilities to understand related literature, explain ideas, do research, and write about results.
- Have ability to use statistical data, apply abstract concepts to practical problems, and make decisions based on data and experience.
- Be able to relate well to people.
- Have ability to do detailed work accurately and plan and direct a project.

WORK SETTING

Environment

Work indoors in offices and classrooms with possible travel to do research projects.

Hours

Work 40 hours a week with longer hours possible.

Employers

Educational institutions, government agencies, business and industrial firms, private institutes, research firms, consulting firms, and self-employed.

CONSIDERATIONS

- Much time is spent in study, research, and detailed paperwork, using scientific methods and precise data.
- During research projects, worker may be subjected to unpleasant environments.
- Job carries prestige and may offer opportunity to be involved in public planning.

NEBRASKA EMPLOYMENT

About 173 social scientists are projected to be employed by 1991. Sociologists are included in this group.

WAGES

Entry level positions for persons with a masters degree in sociology start within the $17,000 to $20,000 a year range. Sociologists with an earned doctorate start within the $19,000 to $35,000 range for those in educational institutions, and up to $40,000 for those employed in business and industry. Many sociologists supplement their incomes with earnings from consulting and counseling work. Nationally salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
Favorable

National
Unfavorable
Factors

- The number of people graduating with advanced degrees is expected to be more than the number of openings.
- People with less than a doctorate will find very limited opportunities in sociology.
- Positions in industries or businesses which make use of statistical skills will offer some opportunities.

PREPARATION

SKILLS

- Knowledge of principles, theories, and methods of sociology and how to apply these to practical problems.
- Skills in statistics, research techniques, and data analysis.
- Knowledge of other social sciences.
- Skills in using computers for research.
- Skills in interviewing, report writing, and oral presentation.
- Skills in supervision and working with people.

TRAINING

- People with bachelors degrees in sociology may find jobs as interviewers, research assistants, or administrative assistants.
- The minimum educational requirement for a position as a sociologist is a masters degree in sociology.
- Most positions require a doctorate in sociology.

EDUCATIONAL PROGRAM

581	Social Sciences
587	Sociology
588	Ethnic Studies

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, history, government, economics, psychology, sociology, goeography, health, computer science, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 51.
Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535.
Occupational Outlook Handbook (1990-91 ed.), p. 108.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

1919 SOCIAL SCIENTISTS

OCCUPATIONAL DESCRIPTION

Social scientists study human behavior in an effort to understand the relationship between culture and the environment and to try to provide solutions to social problems and to increase knowledge. They gather and analyze data which deals with social organization and interaction. They use such information to design social programs and to suggest solutions to particular problems.

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Anthropologists (055.067-010) (19191)
Philologists (059.067-010)
Scientific Linguists (059.067-014)
Intelligence Research Specialists (059.167-010)
Biographers (052.067-010)
State-Historical Society Directors (052.067-014)
Genealogists (052.067-018)
Historians (052.067-022)
Political Scientists (051.067-010)
Archeologists (055.067-018)
Ethnologists (055.067-022)

NCIS RELATED OCCUPATIONS

1916	Sociologists
1920	Urban and Regional Planners
2032	Social Workers
2520	Archivists and Curators

WORK ACTIVITIES

- Study the cultures of various peoples.
- Study the theories and organizations of governments.
- Describe and interpret events of past and present.
- Compare the cultures of living peoples with those no longer existing to study historical relations and cultural processes.
- Reconstruct, study, and interpret the artifacts and architectural features of extinct cultures.
- May teach.

APTITUDES

- Have ability to learn social sciences and research techniques.
- Have high verbal ability to read materials, explain ideas, and write reports and articles.
- Be able to do detailed work accurately and plan and direct projects.
- Have good math ability for research.
- Be able to work with people and work independently.

WORK SETTING

Environment
Work indoors in offices and classrooms and outdoors at sites of digs.

Hours
Work 40 hours a week; some work on flexible schedules and some longer hours possible.

Employers
Educational institutions, government agencies, industries, consulting firms, historical societies, museums, libraries, research organizations, businesses, and self-employed.

CONSIDERATIONS

- Social scientists may have opportunity to influence public policies and decisions.
- Some may have structured schedules with tight deadlines and heavy workloads.

NEBRASKA EMPLOYMENT

About 197 social scientists are projected to be employed by 1991.

WAGES

In Nebarska, entry level salaries for social scientists with a masters degree range between $17,000 and $21,000 a year. Social scientists who have earned the doctorate start within the $20,000 to $35,000 a year range depending on academic records, experience in research, and involvement in community issues. National salaries parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Unfavorable
Factors

- The number of people with graduate degrees in the social sciences is expected to be greater than demand through the 1980's.
- People with less than a doctorate will find limited opportunities.
- Future job opportunities are influenced by the ups and downs in the economy.

PREPARATION

SKILLS

- Knowledge of social sciences in general and of a specific branch.
- Knowledge of research methods and computer science.
- Skills in analysis, decision making, writing, and speaking.
- Ability to plan and direct projects.
- Ability to remain objective.

TRAINING

- The minimum educational requirement is a bachelors degree. These people may find jobs as assistants or trainees.
- A graduate degree is necessary for most entry-level jobs.
- Previous work experience in research or involvement in community issues or service is helpful.

EDUCATIONAL PROGRAM

581	Social Sciences
582	Anthropology
584	Geography
585	History
586	Political Science
588	Ethnic Studies
589	Interdisciplinary Studies

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, biology, history, government, economics, sociology, psychology, geography, computer science, literature, composition, speech, and art history.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 50-52.

Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535.

Occupational Outlook Handbook (1990-91 ed.), p. 101.

SCHOOLS

21801	Bellevue College
49705	Bryan Memorial Hospital Clinical Pastoral Education Program
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

19191 ANTHROPOLOGISTS

OCCUPATIONAL DESCRIPTION

Anthropologists study the way of life, remains, language, and physical char-acteristics of people in all parts of the world. They compare the customs, values, and social patterns of different cultures. Anthropologists generally specialize in one of four areas: cultural anthropology, archeology, linquistics, or physical anthropology. DOT 055.067-010

HOLLAND CODES

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Physical Anthropologists (055.067-014)
Archeologists (055.067-018)
Ethnologists (055.067-022)
Artifacts Conservators (055.381.010)

NCIS RELATED OCCUPATIONS

1916	Sociologists
1919	Social Scientists
2032	Social Workers
2520	Archivists and Curators

WORK ACTIVITIES

- Gather, study, and report data on human physique, social customs, and artifacts of a particular cultural group.
- Apply the data and research techniques to the solution of human relations problems.
- Teach, prepare publications, or direct a team in field research.
- Study artifacts and other remains to determine social life and customs using scientific methods.
- Protect archeological sites.

APTITUDES

- Be able to learn the methods and principles of anthropology and research.
- Have strong verbal abilities for use in reading, writing, and speaking.
- Be able to visualize objects in two or three dimensions and to see slight differences in objects.
- Have ability to reason, analyze data, and be objective and systematic in work.
- Be able to make decisions based on experience, data, and observation.
- Have patience, perseverance, and intellectual curiosity.

WORK SETTING

Environment
Work indoors in offices, laboratories, and classrooms and outdoors in field research projects.
Hours
Work 40 hours a week.
Employers
Educational institutions, government agencies, museums, consulting firms, and resereach centers.

CONSIDERATIONS

- Some have structured schedules with tight deadlines and heavy workloads.
- Workers spend a great deal of time working alone analyzing data and doing technical writing or working as part of a team doing field research projects.
- Field work often involves travel, exposure to weather, adjusting to new living conditions, and lifting and digging.

NEBRASKA EMPLOYMENT

About 197 social scientists are projected to be employed by 1991. Anthropologists are included in this group.

WAGES

In Nebraska entry level salaries for social scientists with a masters degree range between \$17,000 - \$21,000 a year. Social scientists who have earned the doctorate start within the \$20,000 to \$35,000 a year range depending on academic records, experience in research, and involvement in community issues. Many anthropologists have additional income from consulting and teaching. Nationally, salaries parallel those of Nebraska.

180

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Unfavorable
Factors

- The number of people with graduate degrees in anthropology is expected to be greater than the demand through the 1980's.
- The best opportunities will be in non-teaching areas and will be for those with specialties in archeology and physical, medical, and urban anthropology.

PREPARATION

SKILLS

- Knowledge of anthropology; of physical, environmental, and biological sciences; and of research techniques.
- Skills in analysis, decision making, writing, and speaking.
- Ability to plan and direct projects.

TRAINING

- A bachelors degree in anthropology is the minimum educational requirement and is adequate for some beginning level positions in government agencies.
- Most other employers require applicants with advanced degrees.

EDUCATIONAL PROGRAM

581	Social Sciences
582	Anthropology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, biology, history, government, economics, sociology, psychology, geography, literature, composition, art, drama, computer science, and foreign language.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 51-52.
Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535.
Occupational Outlook Handbook (1990-91 ed.), p. 101.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
21612	Midland Lutheran College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus

1920 URBAN AND REGIONAL PLANNERS

OCCUPATIONAL DESCRIPTION

Urban and regional planners develop comprehensive plans for overall growth and improvement of urban, suburban, and rural areas. They collect and analyze data on land use, transportation, and environmental resources and use this information to advise agencies on how best to solve spatial, organizational, and planning problems. They also prepare materials that show how these plans can be carried out and what they will cost. DOT 199.167-014

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

NCIS RELATED OCCUPATIONS

1610	Architects
16101	Landscape Architects
1912	Economists
19121	Market-Research Analysts I
1916	Sociologists
1919	Social Scientists

WORK ACTIVITIES

- Collect and analyze data on various factors affecting land use, transporation, urban redevelopment and design, economic resources, and social services.
- Prepare graphs and reports about the data.
- Recommend solutions relating to land use, community facilities, housing, transportation, human relations, and environmental needs.
- Meet with decision-making bodies and other community groups.
- Design and evaluate special studies or projects.
- Keep abreast of legal issues involved in community development.

APTITUDES

- Be able to understand urban problems, analyze data, and apply solutions.
- Have strong verbal abilities in reading, writing, and speaking.
- Have good math abilities to do research projects and use statistical information.
- Be able to visualize objects and see importantdetail.
- Be able to relate well to people, make decisions based on observations, and handle detailed paperwork.
- Have initiative, imagination, and a commitment to human needs.

WORK SETTING

Environment
Work indoors in offices and community settings.
Hours
Work 40 hours a week with longer hours possible and frequent evening meetings.
Employers
Government agencies, land developers, consulting firms, research organizations, community organizations, and self-employed.

CONSIDERATIONS

- Urban planners in large offices may need to specialize in one area of planning.
- Job carries prestige.

NEBRASKA EMPLOYMENT

About 184 urban and regional planners are projected to be employed by 1991.

WAGES

Entry level salaries for planners with a masters degree vary widely with a range of $18,000 to $35,000 a year. Individuals with superior academic records and experience will command the highest salaries in private business. Starting salaries in government service will be somewhat lower and will vary depending on the level of the agency. Two out of three urban and regional planners are employed in Federal, State, and local government agencies. Many planners have additional income from consulting and teaching. National salaries parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
Favorable

National
Unfavorable
Factors

- Job opportunities depend on availability of public funds.
- New job opportunities are expected to occur in environmental planning.
- Competition is expected because of the growing number of students in this field enrolling in graduate programs.
- The outlook in Nebraska is very favorable but this is a small occupational group.

PREPARATION

SKILLS

- Knowledge of urban problems, government and organization regulations, physical sciences, research and planning techniques, and computer analysis methods.
- Skills in statistical analysis, problem solving, and obtaining grants.
- Skills in writing, speaking, and analyzing maps.
- Skills in working with people and handling public opposition.

LICENSING OR CERTIFICATION

- Professional recognition is earned through certification by the American Institute of Certified Planners.
- To qualify for certification, a person must pass a written exam and meet experience and degree requirements.

TRAINING

- Some employers hire people with a bachelors degree which is the minimum educational requirement.
- Most positions require an advanced degree in urban planning including practical field experience or internship work.

EDUCATIONAL PROGRAM

131	Architecture and Environmental Design
562	Public Administration
581	Social Sciences
584	Geography
586	Political Sciences
587	Sociology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including classes in math, government, economics, sociology, psychology, geography, health, construction, computer science, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 149.
Guide for Occupational Exploration (2nd ed., 1984), pp. 532-535.
Occupational Outlook Handbook (1990-91 ed.), p. 110.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21827	University of Oklahoma Advanced Programs
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

2032 SOCIAL WORKERS

OCCUPATIONAL DESCRIPTION

Social workers help individuals and groups solve personal and social problems. They interview clients to identify problems and provide counseling. They also develop plans to meet needs and may determine eligibility for assistance, funds, and services. They help clients get services and record case progress. They plan activities for groups, place children in foster homes, and help patients and families cope with illnesses.

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Volunteer Services Supervisors (187.137-014)
Caseworkers (195.107-010)
Medical Social Workers (195.107-030)
Psychiatric Social Workers (195.107-034)
School Social Workers (195.107-038)
Group Workers (195.164-010)
Community Organization Workers (195.167-010)
Public Housing Community Relations and Services Advisors (195.167-014)
Parole Officers (195.167-030)
Probation Officers (195.167-034) (20322)
Human Relations or Drug and Alcohol Counselors (195.267-014) (20323)
Case Aides (195.367-010) (20324)
Social-Services Aides (195.367-034)
Military Social Workers (M20320)
Military Caseworkers and Counselors (M20321)

NCIS RELATED OCCUPATIONS

12103	Institution Directors
1915	Psychologists
1916	Sociologists
1919	Social Scientists
19191	Anthropologists
2033	Recreation Workers
2042	Clergy
2401	Vocational and Educational Counselors
24011	Counselors
24012	Residence Counselors
24013	Vocational-Rehabilitation Counselors

WORK ACTIVITIES

- Gather and analyze information about their clients.
- Identify clients' problems and evaluate their availability for assistance.
- Provide counseling and other aid.
- Keep records on their clients' progress, maintain contact with them, and arrange for other services if necessary.
- Plan services in cooperation with civic and government agencies.
- Arrange for adoption or placement of children.
- Plan or direct group activities to meet the needs of people of all ages.
- Recruit, train, and supervise volunteers and paid workers.

APTITUDES

- Be able to learn the principles and methods of social work and community organization.
- Have good verbal and math abilities.
- Be able to relate to all types of people and be persuasive.
- Be able to keep accurate records and write reports.
- Be able to direct, organize, and plan projects, treatments, and programs.
- Be able to make decisions based on experience and observation.
- Have patience, persistence, empathy, good judgment, and tolerance.

WORK SETTING

Environment
Work indoors in offices or in community setting.
Hours
Work 40 hours a week with evening and weekend hours.
Employers
Government agencies, hospitals, youth facilities, institutions, private agencies, schools, nursing homes, and religious organizations.

CONSIDERATIONS

- Social workers may be confronted with distressing situations.
- Job may be stressful, but workers receive personal satisfaction from helping others.
- Worker may need to travel in own car to visit clients and attend meetings.

NEBRASKA EMPLOYMENT

About 3,776 social workers are projected to be employed by 1991.

WAGES

Entry level salaries for social workers who have completed the Masters of Social Work degree (MSW) employed by public agencies average between $16,500 and $22,500 a year. Social workers employed by hospitals and medical centers will start at the upper end of the scale. National salary figures compare favorably with those of Nebraska with a somewhat higher upper range of $26,000 a year. In federal government, social workers with an MSW start at approximately $25,500 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- The actual number of openings will be affected by government funding available for social work programs.
- Opportunities could increase as the public responds to the needs of the growing and aging population.
- Job opportunities are best for those with advanced degrees.

PREPARATION

SKILLS

- Knowledge of the principles of human behavior, counseling and guidance methods, social welfare policies, community resources and services, sociology, psychology, economics, and current social trends.
- Skills in communication, listening, interviewing, and persuading.
- Skills in handling stress and hostility.
- Ability to keep accurate records, prepare clear reports, collect and analyze pertinent facts, and make decisions.
- Skills in working with all kinds of people in all types of situations.

LICENSING OR CERTIFICATION

- For professional recognition a person may become certified by the Academy of Certified Social Workers and receive the title ACSW.
- To earn the ACSW title, a person must have a masters degree in social work, pass an exam given by the National Association of Social Workers, and have at least two years of social work experience.
- In Nebraska, the licensing authority is the State Board of Examiners in Social Work. Individuals may be certified at either bachelors or masters level. Apllicants must have completed a degree, have 3,000 hours of supervised experience and pass the exam. Thirty two hours of continuing education biennially.

TRAINING

- A masters of social work (MSW) degree is usually the minimum requirement for employment.
- A bachelors of social work (BSW) degree is adequate for a few entry-level positions.
- A doctoral degree is necessary for most teaching and some supervisory positions.

EDUCATIONAL PROGRAM

238	Counseling
392	Individual and Family Development
541	Psychology
565	Social Work
587	Sociology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in biology, government, economics, psychology, sociology, health, child care, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 143-146.

Guide for Occupational Exploration (2nd ed., 1984), pp. 444-448, 509-512, and 550-553.

Occupational Outlook Handbook (1990-91 ed.), p. 115.

Military Career Guide (1988-89 ed.), pp. 47 and 270.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College

21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21713	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

20322 PROBATION OFFICERS

OCCUPATIONAL DESCRIPTION

Probation officers work with adult and juvenile offenders who have been placed on probation by the courts rather than being sent to prison. They investigate the offender's background and report their findings and recommendations to the court prior to sentencing. They maintain close personal contact with those placed on probation, monitor compliance with conditions of probation, and help the probationer establish suitable ties with the community. DOT 195.167-034

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

1915	Psychologists
1916	Sociologists
2032	Social Workers
20323	Drug and Alcohol Counselors
20324	Case Aides
2401	Vocational and Educational Counselors
24011	Counselors
5133	Correctional Institution Officers

WORK ACTIVITIES

- Determine which juvenile cases fall within court jurisdiction and authorize detention of juveniles.
- Prepare presentencing reports and social histories for the courts.
- Suggest treatment and arrange for clinical services.
- Evaluate probationer's progress and report progress to the court.
- Work with probationer according to arranged treatment plan.
- Execute warrants and apprehend probation violators.
- Maintain complete and accurate case records.
- Work with community group.

APTITUDES

- Be able to learn the principles and practices of criminal justice.
- Have verbal ability to counsel people, read professional materials, and write reports.-
  Be able to handle a variety of activities, make decisions based on observation and intuition, and work with a variety of people.
- Have ability to organize treatment plans and projects for offenders.
- Have resourcefulness, interest in helping people, and ability to gain the confidence of others.

WORK SETTING

Environment

Work indoors in offices, courtrooms, and community settings.

Hours

Work 40 hours a week; schedule may include weekend and evening hours.

Employers

City, county, state or federal agencies.

CONSIDERATIONS

- Rural workers may travel extensively.
- Workers in city areas may be exposed to danger while walking through high crime areas.
- Although there are many frustrations, this job may be rewarding.

NEBRASKA EMPLOYMENT

About 3,776 social workers are projected to be employed by 1991. Probation officers are included in this group.

WAGES

In Nebraska, probation officers with a bachelors degree receive a starting wage between $16,000 and $18,500 a year. Individuals with a masters degree start within a range of $18,000 to $23,265 a year depending on academic records, experience and the size and location of the area of jurisdiction. Nationally, the entry level salary range for all probation officers is slightly broader than that of Nebraska with a range of $15,000 to $26,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Somewhat Favorable

Factors

- Job opportunities depend mainly on government funding and public attitudes toward counseling and rehabilitation of offenders.

PREPARATION

SKILLS

- Knowledge of criminology, the justice system, law, practices of sentencing and probation, psychology, and sociology.
- Skills in counseling, communication, recordkeeping, and report writing.
- Skills in supervision and decision making.

TRAINING

- A bachelors degree in criminal justice or one of the social services is the minimum educational requirement.
- Some employers prefer people with a graduate degree in criminal justice or criminology with concentration on probation, parole, and community corrections.
- Counseling experience is helpful.

EDUCATIONAL PROGRAM

238	Counseling
541	Psychology
567	Criminal Justice
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in psychology, sociology, government, health, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 145.
Guide for Occupational Exploration (2nd ed., 1984), pp. 444-448.
Occupational Outlook Handbook (1990-91 ed.), p. 115.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
99301	Nebraska Law Enforcement Training Center
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

20323 DRUG AND ALCOHOL COUNSELORS

OCCUPATIONAL DESCRIPTION

Drug and alcohol counselors help develop, organize, and conduct programs to prevent and solve drug abuse problems. DOT 195.267-014

HOLLAND CODE

SAE (Social, Artistic, Enterprising)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20322	Probation Officers
20324	Case Aides
2042	Clergy
2401	Vocational and Educational Counselors
24011	Counselors
24012	Residence Counselors
24013	Vocational-Rehabilitation Counselors
26107	Psychiatrists

WORK ACTIVITIES

- Conduct individual or group counseling sessions.
- Collect data to identify local problems and provide information and advice to deal with those problems.
- Prepare and maintain files, reports, and records of individuals counseled or referred to other agencies.
- Set up programs to prevent drug and alcohol abuse.
- Help individuals with drug and alcohol problems to return to normal functioning.
- Plan, organize, and conduct training sessions for personnel involved in drug and alcohol abuse programs.

APTITUDES

- Be able to learn methods of counseling and treating clients.
- Have good verbal ability to use in reading, writing, and speaking.
- Be able to make decisions based on observation and personal judgment.
- Be able to plan, organize, and direct programs and training sessions.
- Be able to relate well to people and persuade them to make changes.
- Have patience, persistence, tolerance, and empathy.

WORK SETTING

Environment
    Work indoors in offices, clinic areas, conference rooms, and patient and treatment areas.
Hours
    Work 40 hours a week with some evening and weekend hours.
Employers
    Hospitals, alcohol treatment agencies, and government agencies.

CONSIDERATIONS

- Job may be stressful; workers may deal with people who are uncooperative or unresponsive.
- Workers may receive personal satisfaction from helping people deal with their problems.

NEBRASKA EMPLOYMENT

About 3,776 social workers are projected to be employed by 1991. Drug and alcohol counselors are included in this group.

WAGES

Entry level salaries for drug and alcohol counselors vary widely depending on the amount of education completed. In Nebraska, starting wages range between $15,000 and $22,300 a year. National starting salary figures compare favorably with Nebraska with a somewhat higher upper range of $26,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- A growing awareness of alcohol and drug problems and the need for treatment should add to the need for these workers.
- The actual number of openings depends on the amount of funding available.

PREPARATION

SKILLS

- Knowledge of race relations, drug and alcohol abuse, and treatment methods used to change behaviors in this area.
- Skills in counseling, problem solving, and planning and delivering treatment.
- Ability to keep accurate records, write reports, test clients, and evaluate progress.
- Skills in data collection and analysis, negotiation, personnel training, and community planning.

TRAINING

- Some employers may provide on-the-job training.
- Two years of college study in psychology or social services is usually the minimum educational requirement.
- Some employers require these counselors to have bachelors degrees and supervisory positions require advanced degrees.

EDUCATIONAL PROGRAM

238	Counseling
541	Psychology
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including classes in biology, psychology, sociology, health, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 145.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

20324 CASE AIDES

OCCUPATIONAL DESCRIPTION

Case aides assist social workers by working on simple aspects of cases or providing services to less complex cases under the supervision of a caseworker. They provide much of the legwork necessary in implementing social service programs. DOT 195.367-010

HOLLAND CODE

SEC (Social, Exterprising, Conventional)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20322	Probation Officers
20323	Drug and Alcohol Counselors
2401	Vocational and Educational Counselors
24011	Counselors
24012	Residence Counselors
24013	Vocational-Rehabilitation Counselors
3032	Occupational Therapists
4642	Interviewing Clerks
4795	Teacher Aides
5233	Health Aides
5236	Nursing Aides, Orderlies, and Attendants

WORK ACTIVITIES

- Explain services and facilities of social services agencies.
- Interview clients who request aid and help them fill out the forms properly.
- Keep client records up to date and keep file system of reports.
- Determine eligibility of client for assistance.
- Refer clients to community resources.
- Assist neighborhood organizations in planning projects.

APTITUDES

- Be able to learn the basics of casework services.
- Be able to use words to communicate with clients, fill out forms, and write reports.
- Be able to use numbers, handle detailed paperwork, keep accurate records, organize information, and follow regulations.
- Be able to handle a variety of activities, relate well to people, and plan projects.
- Be able to make decisions based on observations and information.

WORK SETTING

Environment

Work indoors in offices and community settings.

Hours

Work 40 hours a week with possible evening and weekend hours; part-time positions are often available.

Employers

Government agencies; religious, voluntary, or private social service organizations; hospitals; and community and neighborhood centers.

CONSIDERATIONS

- Work offers potential for personal satisfaction from helping people.
- Case aides serve as links between clients and professional social workers within an agency.
- These workers may have to deal with difficult situations.

NEBRASKA EMPLOYMENT

About 890 case aides are projected to be employed by 1991.

WAGES

Starting wages for case aides vary according to the amount of education completed and the size and type of agency or organization. In Nebraska, entry level salaries range between $9,360 and $15,000 a year. Nationally, entry level wages tend to parallel those of Nebraska. Case aides employed by State, local or federal government agencies tend to start at higher wages than case aides employed in the private sector.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Somewhat Favorable

Factors

- More opportunities will develop as social welfare services expand for the aged, disabled, and disadvantaged populations.

- Employment opportunities may vary somewhat depending on the economy and funding.

PREPARATION

SKILLS

- Knowledge of principles of social casework, social service agencies, and regulations and forms used in working with clients.
- Skills in typing, recordkeeping, and interviewing.
- Skills in decision making and organizing.

TRAINING

- Some employers hire people with a high school diploma and provide on-the-job training.
- Usually the minimum educational requirement is two years of postsecondary education.
- Community college programs in human services with courses in psychology and sociology, training in interviewing, and field experience provide a good background.

EDUCATIONAL PROGRAM

565	Social Work
581	Social Sciences
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

The following courses would provide a good background: sociology, psychology, government, composition, speech, and typing or data processing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 146.

Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus

2033 RECREATION WORKERS

OCCUPATIONAL DESCRIPTION

Recreation workers plan, organize, and direct activities designed to help people enjoy their free time. They work in many areas of recreation such as athletics, cultural arts and crafts, camping, dance, or recreation for seniors and handicapped. They may work in such places as summer camps, parks, playgrounds, or recreation centers.

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Camp Counselors (159.124-010)
Recreation Center Directors (195.167-026)
Recreation Leaders (195.227-014)
Military Recreation Specialists (M20330)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
2032	Social Workers
2330	Secondary School Teachers
3032	Occupational Therapists
3270	Dancers
3401	Athletes and Related Workers
34011	Athletic Trainers

WORK ACTIVITIES

- Plan, organize, and direct activities or classes.
- Manage recreational facilities.
- Train and organize staff.
- Review programs, prepare budgets, and order supplies and equipment.
- Work with community and sponsoring groups.
- Cooperate with recreation and nonrecreation personnel when working in an agency setting.

APTITUDES

- Be able to learn theories, methods, and principles of recreation leadership.
- Have good verbal ability in reading, writing, and speaking.
- Have physical coordination.
- Be able to plan, organize, and direct activities.
- Be able to work with a variety of people.

WORK SETTING

Environment
    Work indoors in offices and recreation areas and outdoors.
Hours
    Work 40 or more hours a week; schedule may be irregular and include evening, weekend, and holiday hours.
Employers
    Government agencies, hotels and resorts, camps, parks, apartment complexes, educational institutions, hospitals, youth agencies, rehabilitation centers, athletic clubs, and private firms.

CONSIDERATIONS

- Work may be seasonal.
- Recreation workers must be physically fit and able to react quickly and calmly during emergencies.

NEBRASKA EMPLOYMENT

About 2,102 recreation workers are projected to be employed by 1991.

WAGES

Starting salaries for recreation workers vary widely according to the amount of education completed, the size, location and type of agency, institution or club. Entry level wages for recreation workers employed full time in Nebraska range between $12,688 and $19,344 a year. Nationally, entry level wages tend to parallel Nebraska figures with a somewhat expanded upper range of $23,000 a year. The higher salaries will be found in major year-round resort areas and large private health clubs.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- The fastest growth in employment opportunities is in industrial and commercial sectors.
- Many positions are part-time and seasonal.

- Increased opportunities depend upon funding of recreational activities.
- Competition is expected for many of the full-time positions.

PREPARATION

SKILLS

- Knowledge of principles and methods of physical education, health, and recreation.
- Skills in athletic and recreational activities, drama, music, arts, or crafts.
- Skills in planning, organizing, and supervising.
- Knowledge of first aid.
- Ability to plan, equip, and maintain recreational facilities.

TRAINING

- The minimum educational requirement is two years of college training in recreation, physical education, or health.
- Many employers prefer those who have a bachelors degree in recreation.
- The National Recreation and Park Association (NPRA) offers the National Internship Program for new graduates from recreation programs.

EDUCATIONAL PROGRAM

235	Teacher Education, Specific Subject Area
564	Recreation

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in sociology, psychology, physical education, health, arts and crafts, drama, music, child care, marketing, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 89 and 145.
Guide for Occupational Exploration (2nd ed., 1984), pp. 492-495.
Occupational Outlook Handbook (1990-91 ed.), p. 118.
Military Career Guide (1988-89 ed.), p. 48.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2042 CLERGY MEMBERS

OCCUPATIONAL DESCRIPTION

Clergy Members serve the spiritual and religious needs of people through worship services, personal counseling, and other activities. Clergy Members include ministers, rabbis, and priests in the Protestant, Catholic, Jewish, and other faiths. DOT 120.007-010

HOLLAND CODE

SAI (Social, Artistic, Investigative)

SPECIALTIES

Military Chaplains (M20420)
Military Religious Program Specialists (M20421)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20323	Drug and Alcohol Counselors
24012	Counselors

WORK ACTIVITIES

- Study and interpret the teachings of their religions and use this knowledge to prepare and deliver sermons and to instruct religious classes.
- Counsel people regarding spiritual, moral, and personal issues.
- Conduct weddings and funeral services.
- Help the poor, visit the sick and elderly, and comfort grieving families.
- Oversee and administer church or synagogue programs and affairs.
- Serve in community organizations or teach in seminaries and universities.

APTITUDES

- Have deep religious beliefs and a desire to serve needs of people.
- Have ability to learn theology and practices of chosen religious groups.
- Have high verbal abilities in public speaking, reading, and writing and be able to interpret feelings or ideas while speaking or counseling.
- Be able to work with numbers, handle detailed paperwork, and make judgments based on observation and experience.
- Be able to work with and influence a variety of people.
- Be able to supervise people, work well under pressure, and enjoy continuing study.

WORK SETTING

Environment
Work indoors in offices, areas of worship, or in community settings.
Hours
Work 40 to 70 hours a week; irregular schedule with evening, weekend, and holiday hours; may be on call 24 hours a day.
Employers
Synagogues, churches, educational institutions, hospitals, armed forces, counseling centers, prisons, and social service agencies.

CONSIDERATIONS

- Clergy's personal life may be affected by the amount of work involved.
- This job requires a person who is healthy physically and emotionally.
- Job involves work with people, information, abstract ideas, social issues, and community concerns.
- Occupation carries prestige and may be rewarding.

NEBRASKA EMPLOYMENT

About 3,000 clergy members are projected to be employed by 1991.

WAGES

Entry level salaries for clergy vary substantially depending on experience, denomination, size and wealth of congregation and geographic location. In Nebraska, starting salaries for ordained clergy range between $12,000 and $16,000 a year. Additional compensation in the form of housing and transportation may add as much as 25 percent to the annual salary. National entry wage figures are somewhat broader than Nebraska averages with a $7,200 to $24,000 range. Some clergy must take vows of poverty and are supported entirely by their religious order.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Somewhat Favorable
Factors

- More need for Catholic priests is expected through mid-1980's.
- Reform and Orthodox Jewish rabbis may face competition, but conservative rabbis should have good employment opportunities.
- Opportunities for Protestant ministers vary by denomination, but evangelical congregations will probably have a continuing need for ministers.
- Candidates with graduate degrees may have better job opportunities.

PREPARATION

SKILLS

- Knowledge of doctrines, traditions, practices, and liturgies or sacraments common to the religious group chosen.
- Skills in counseling, management, religious instruction, visitation, and group work.
- Skills in speaking and writing.

LICENSING OR CERTIFICTION

- Most clergy must be licensed or ordained by their particular denomination or church body in order to serve a congregation.

TRAINING

- Minimum educational requirement is usually graduate training from a seminary, but some denominations employ people with a bachelors degree or no specific training.
- Undergraduate majors appropriate for seminary include history, social sciences, philosophy, and religion.

EDUCATIONAL PROGRAM

581	Social Sciences
585	History
591	Philosophy
592	Religion
595	Theology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in history, sociology, psychology, health, accounting, literature, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 76-77.

Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512.

Occupational Outlook Handbook (1990-91 ed.), p. 121.

Military Career Guide (1988-89 ed.), pp. 49 and 269.

SCHOOLS

21801	Bellevue College
49705	Bryan Memorial Hospital Clinical Pastoral Education Program
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
21226	Platte Valley Bible College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2110 LAWYERS

OCCUPATIONAL DESCRIPTION

Lawyers advise individuals and businesses of their legal rights and obligations and represent them in courts of law. They consult with clients to determine the details of problems, advise them of the law, and suggest action that might be taken. They also study and interpret laws, draft legal papers, and represent clients in courts and before government agencies. Some act as trustees and guardians or help write laws and establish ways to enforce them. A few teach or hold management positions. DOT 110.107-010

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Criminal Lawyers (110.107-014)
District Attorneys (110.117-010)
Insurance Attorneys (110.117-014)
Corporation Lawyers (110.117-022)
Probate Lawyers (110.117.030)
Real Estate Lawyers (110.117-034)
Tax Attorneys (110.117-038)
Military Lawyers (M21100)

NCIS RELATED OCCUPATIONS

2120	Judges
3960	Legal Technicians
5132	Police and Detectives
5134	Sheriffs, Bailiffs, and Law Enforcement Officers

WORK ACTIVITIES

- Do research in law libraries, study public records, and conduct interviews to gather evidence.
- Plan a defense or legal action.
- Represent a client in court or before government agencies.
- Negotiate out-of-court settlements.
- Prepare legal documents such as contracts and wills, reports, and briefs.
- Study and interpret the law and apply it to specific facts in the case.
- Act as trustee, guardian, or executor of a will.
- May specialize in a particular phase of the law such as criminal, corporate, tax real estate, or insurance.

APTITUDES

- Be able to learn the details of legal procedures and the body of the law.
- Have excellent verbal abilities for speaking, reading, and writing.
- Have ability for logical and abstract thinking and using numbers.
- Be able to work well with people and influence their attitudes and judgments.
- Be able to make decisions based on application of legal principles to practical situations and a variety of knowledge.
- Be able to handle detailed paperwork.

WORK SETTING

Environment
Work indoors in offices, courtrooms, and law libraries.
Hours
Work long hours including evenings and weekends.
Employers
Private law firms, government agencies, corporations, businesses, educational institutions, public and private institutions, self-employed in private practice.

CONSIDERATIONS

- Lawyers work under much pressure and the hours are often long.
- Establishing a private practice may be expensive and difficult.
- Job carries prestige and is often rewarding.

NEBRASKA EMPLOYMENT

About 3,124 lawyers are projected to be employed by 1991.

WAGES

Salaries for beginning attorneys vary significantly according to academic records, type, size and location of employer, and the desired specialized educational background. In Nebraska, starting salaries for all attorneys range from a low of $14,000 to a high of $40,000 a year. National salary averages for beginning attorneys also vary significantly at a higher range of $24,000 to $50,000 a year. Lawyers starting their own practice may need to work part time in other occupations during the first years to supplement their income.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors

- Demand for lawyers should continue to grow as new laws, government regulations, and court decisions make businesses and consumers more dependent on legal expertise.
- The current surplus of law school graduates makes strong competition for positions.
- Graduates from well-known law schools and with high academic standings should have good opportunities.
- Small towns and suburbs offer good opportunities for new private practices.

PREPARATION

SKILLS

- Knowledge of legal system, the body of law, and legal practices and procedures.
- Skills in writing, reading, and speaking.
- Skills in conducting legal research and analyzing data.
- Skills in reasoning, persuading, and organizing materials.

LICENSING OR CERTIFICTION

- Lawyers must be licensed by the Nebraska State Bar Commission.
- To be licensed, a persons must prove good moral character, have a law degree (J.D. or LL.B.) from an approved law school, and pass the State Bar exam.

TRAINING

- Minimum educational requirements are three or four years of college plus a three-year law school degree. Graduates receive a Juris Doctor (J.D.) or a Bachelor of Law (LL.B.) degree and must be licensed.
- A person must pass the Law School Admission Test (LSAT) to be admitted to law school.
- Appropriate undergraduate majors include history, philosophy, political science, economics, business, and English.

EDUCATIONAL PROGRAM

421 Law

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in history, government, economics, sociology, psychology, accounting, computer science, literature, composition, speech, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 75.

Guide for Occupational Exploration (2nd ed., 1984), pp. 536-539.

Occupational Outlook Handbook (1990-91 ed.), p 96.

Military Career Guide (1988-89 ed.), p. 304

SCHOOLS

21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2120 JUDGES

OCCUPATIONAL DESCRIPTION

Judges preside over courts of law and hold hearings to settle legal disputes. They listen to cases being presented, examine evidence, advise lawyers and juries, and set fines and sentences. In some cases they decide verdicts. They may also perform marriage ceremonies, do legal research, and set rules of procedure to use in court hearings. Also included in this group are officials such as hearing examiners and arbitrators who do not preside over courts but who do render decisions which have standing in courts of law. DOT 111.107-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Magistrates (111.107-014)
Hearing Officers (119.107-010)
Veteran Appeals Reviewers (119.117-010)
Adjudicators (119.167-010)
Appeals Referees (119.267-014)
Claims Adjudicators (169.267-010)

NCIS RELATED OCCUPATIONS

2110	Lawyers
3960	Legal Technicians

WORK ACTIVITIES

- Listen to presentation of cases, rule on use of evidence and methods of giving testimony, and settle disputes between opposing attorneys.
- Instruct the jury on how the law applies and direct jury to decide verdict based on the facts presented.
- Sentence person convicted by jury in criminal cases.
- Prepare written decisions on cases.
- Conduct hearings to determine if a defendant should be held for trial.
- Research laws and policies to prepare for an appeals hearing.
- Recommend compromise settlements be refused or accepted.
- Set rules of procedure.

APTITUDES

- Be able to learn the principles and practices of administering the judicial system.
- Have strong math and verbal abilities for reading, writing, and speaking.
- Be able to direct the affairs of the court, supervise aides, and instruct attorneys and juries.
- Be able to relate to people at all levels.
- Be able to influence and persuade people.
- Be able to make judgments based on observation, intuition, and application of the law to specific problems and issues.
- Have patience, objectivity, calmness, and ability to listen attentively.

WORK SETTING

Environment
Work indoors in courtrooms, offices, and judicial chambers.

Hours
Work 40 or more hours a week with possible evening and weekend hours.

Employers
Municipal, county, district, state, and federal court systems and government agencies.

CONSIDERATIONS

- Judges have a personal obligation to serve the public fairly and justly.
- Salaries vary greatly; they may be less than what an attorney could earn in private practice.
- Some judges are elected and some appointed.
- Issues coming before the courts are more complex every year.

NEBRASKA EMPLOYMENT

About 371 judges are projected to be employed by 1991.

WAGES

Entry level salaries for judges vary according to type and size of court system and the amount of tax dollars allocated for judges' salaries within the jurisdiction. In Nebraska, salaries for newly appointed or elected judges range between $53,000 and $63,500 a year. National starting salary figures vary significantly with a much broader range of $24,000 to $80,000 a year.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- The number of judges depends on legislatures or Congress who set the number of judges.
- Taxpayers are often unwilling to pay higher taxes for more judges.

PREPARATION

SKILLS

- Knowledge of the body of law and its practical application and interpretation, of legal and judicial systems, and of procedures of administering the courts.
- Skills in supervision, administration, legal researching and writing, and public speaking.
- Ability to relate to and persuade other people.
- Knowledge of human behavior and reasoning and logic.

LICENSING OR CERTIFICTION

- Judges must be licensed as lawyers by the Nebraska State Bar Commission.
- To be licensed, a person must prove good moral character, have a law degree from an approved school, and pass an exam.

TRAINING

- Judges must be graduates of accredited law schools and members of their state bar association.
- Several years of experience as lawyers are usually necessary.
- Judges enter this occupation by being either appointed or elected.

EDUCATIONAL PROGRAM

421 Law

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in history, government, economics, sociology, psychology, accounting, business law, literature, composition, speech, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 75-76 and 106.
Guide for Occupational Exploration (2nd ed., 1984), pp. 536-539 and 571-574.
Occupational Outlook Handbook (1990-92 ed.) p. 96.

SCHOOLS

21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2201 COLLEGE AND UNIVERSITY TEACHERS

OCCUPATIONAL DESCRIPTION

College and university teachers provide advanced instruction to students in specific subject areas. They prepare and present materials and evaluate students through assigned problems, discussions, papers, laboratory work, and exams. They serve as advisors to students and as consultants to government and industry. Most engage in research and write about the results of that research.

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

SPECIALTIES

College or University Department Heads (090.167-010)
College or University Faculty Members (090.227-010)
Military Teachers and Instructors (M22010)

NCIS RELATED OCCUPATIONS

12101	School Superintendents
1281	College and University Administrators
1282	Elementary and Secondary Education Administrators
2320	Elementary School Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators
2390	Adult Education Teachers
23901	County Home-Demonstration Agents
23902	Home Economists
23903	County-Agricultural Agents
23904	Vocational Training Instructors
2401	Vocational and Educational Counselors
24011	Counselors

WORK ACTIVITIES

- Prepare and deliver lectures, make assignments, supervise student projects, and lead discussions.
- Give exams, grade students' work, and advise students on their coursework.
- May conduct research, publish books or articles, participate in various professional activities, and serve on faculty committees.
- May advise and train graduate students, direct the research of other teachers or graduate students, or do outside consulting.

APTITUDES

- Have ability to learn the details of a specialized field as well as general information about related areas.
- Be able to think abstractly, to understand concepts and relationships of ideas, to plan projects and coursework, and to make judgments based on analysis of data.
- Be able to proofread and check accuracy of written materials.
- Have high verbal ability for reading, writing, and speaking.
- Be able to relate to people and influence others with ideas.

WORK SETTING

Environment
Work indoors in offices or classrooms.
Hours
Work 40 to 50 hours a week; schedules are flexible and may include evening hours; some may work nine months and some twelve months of the year.
Employers
State colleges or universities, junior colleges, private colleges or universities, and community or technical schools.

CONSIDERATIONS

- Occupation offers freedom in planning one's own schedule and allows some free time during the summer.
- Paperwork in the evenings and on weekends is often necessary.
- Job may include pressure to do research and publish results, but research accomplishments and teaching activities may be rewarding.
- Job carries prestige.

NEBRASKA EMPLOYMENT

About 3,937 college and university teachers are projected to be employed by 1991.

WAGES

Entry level salaries vary significantly according to faculty rank and type of institution and in some cases by field. Faculty in four-year insti-tutions earn higher salaries, on the average, than those in two-year schools. In Nebraska, starting wages for all college and university teachers range from $16,000 to $39,300 a year. National salary figures compare favorably with Nebraska's with a range $19,000 to $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Unfavorable
Factors
- The number of graduates with advanced degrees is greater than the number of openings.
- Declining enrollments and cuts in budgets and financial aid have reduced job opportunities.
- Some academic areas have more openings than others.

PREPARATION

SKILLS

- Knowledge of a specialized area, teaching methods, and research techniques.
- Skills in speaking, writing, and thinking abstractly and logically.
- Skills in advising and evaluating students' work.

TRAINING

- Minimum educational requirement is a masters degree in the subject area taught, but a doctorate is usually required.
- Many doctoral students work as teaching assistants.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas
237	Special Education

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a variety of courses for a broad educational background plus as many courses as possible in a specific subject area of interest.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 66-67.
Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531 and 550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 128.
Military Career Guide (1988-89 ed.), p. 264.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2310 PREKINDERGARTEN AND KINDERGARTEN TEACHERS

OCCUPATIONAL DESCRIPTION

Prekindergarten and kindergarten teachers instruct children usually from two and a half to six years of age. They provide learning activities to help these children improve their physical, mental, and social skills. They conduct lessons in music, art, and literature and teach simple principles of science, math, health, and language. Besides teaching, they watch children for signs of problems, illness, and progress. They meet with parents to discuss their child's progress or problems. DOT 092.227-014

HOLLAND CODE

SEA (Social, Enterprising, Artistic)

SPECIALTIES

Preschool Teachers (092.227-018)

NCIS RELATED OCCUPATIONS

2320	Elementary School Teachers
2350	Special Education Teachers
23901	County Home-Demonstration Agents
24011	Counselors
4795	Teacher Aides
5060	Child Care Workers
5264	Child Care Providers

WORK ACTIVITIES

- Present information to students.
- Observe and supervise individual and group activities.
- Help students develop skills necessary in the later stages of life.
- Correct tests, keep class records, make reports, and organize group and individual study projects.
- Meet with parents and other staff.
- Supervise children in playground activities.
- Evaluate a child's progress.
- Participate in professional activities.

APTITUDES

- Be able to learn teaching methods and about human development.
- Have ability to communicate with young children, other staff, and parents.
- Have ability to plan and organize a variety of activities, do clerical tasks, and make good judgments.
- Have qualities of creativity and flexibility.
- Have good physical coordination to stoop, reach, and lift moderate loads.

WORK SETTING

Environment
    Work indoors in classrooms or playrooms; some activities may be outdoors.
Hours
    Work 40 hours a week but paperwork in the evening and on weekends is often necessary.
Employers
    Government agencies, day-care centers, preschools, nursery schools, kindergartens, public schools, and private and parochial schools.

CONSIDERATIONS

- Working hours may be long and work activities may be physically and emotionally demanding.
- Salaries are often low with little chance for advancement.
- Working with children and helping guide their early development may be rewarding.

NEBRASKA EMPLOYMENT

About 1,892 preschool and kindergarten teachers are projected to be employed by 1991.

WAGES

Starting salaries for preschool and kindergarten teachers with a bachelors degree or equivalent training and credentials range between $12,000 and $19,900 a year depending on the size, location, and type of school, agency or center. Nationally, entry level salaries vary significantly with a range of $9,000 to $26,700 a year.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Favorable

Factors

- The current growth of the day-care movement may provide more openings.
- The increase in the number of working mothers adds to the need for these teachers.

PREPARATION

SKILLS

- Knowledge of the developmental stages of children and teaching methods.
- Skills in communicating with children and adults, managing behavior, and planning activities.
- Skills in music, art, and crafts.
- Skills in organization and supervision.

LICENSING OR CERTIFICATION

- Prekindergarten and kindergarten teachers who teach in a school system approved by the Nebraska Department of Education must be certified by that department.
- To be certified, a person must have a bachelors degree, a recommendation from a certification official in an approved college, and six hours of approved credit in the last three years.
- For a person who provides a day-care center, preschool, or nursery school a license from the Nebraska Department of Social Services is required.

TRAINING

- A few prekindergarten teachers are trained on the job after receiving a high school diploma.
- Most employers of prekindergarten teachers prefer a two-year associate degree in early childhood development or a related area.
- The minimum educational requirement to teach in a school approved by the Nebraska Department of Education is a bachelors degree plus certification.
- The Child Development Association Consortium gives credentials to people without degrees by a program of on-the-job assessment.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
237	Special Education
391	Home Economics
397	Child Care and Guidance Services
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum with courses in sociology, psychology, physical education, health, arts and crafts, drama, music, home economics, child care, composition, and speech.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 68.

Guide for Occupational Exploration (2nd ed., 1984), pp. 513-518.

Occupational Outlook Handbook (1990-91 ed.), p. 132.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
99332	Nannies of Nebraska
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2320 ELEMENTARY SCHOOL TEACHERS

OCCUPATIONAL DESCRIPTION

Elementary school teachers develop, plan, and present programs of instruction to students in grades one to six. They teach the basic concepts of math, language, science, social science, and other subjects. They help students develop the social skills and study habits necessary for continuing their education. They evaluate student performance, progress, and potential and discuss evaluations with parents. They also attend meetings, plan courses, grade papers, and supervise after-school activities. DOT 092.227-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

1282	Elementary and Secondary Education Administrators
2201	College and University Teachers
2310	Prekindergarten and Kindergarten Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators
24011	Counselors
3401	Athletes and Related Workers
34011	Athletic Trainers
4795	Teacher Aides
5264	Child Care Providers

WORK ACTIVITIES

- Prepare and present programs of study.
- Use lectures, class discussions, demonstrations, assignments, tutoring, audio-visual materials, special projects, and field trips to help children learn.
- Evaluate student performance.
- Maintain classroom discipline.
- Counsel students, and discuss students' progress and problems with parents and other staff.
- Keep records.
- May teach a single grade, combined grades, or a single subject or team teach with other teachers.
- Attend professional meetings and supervise after-school activities.

APTITUDES

- Be able to learn teaching methods and about human development.
- Have verbal ability to read, lecture, write reports, and communicate with children and adults.
- Be able to keep accurate records, handle details, organize materials, and plan activities.
- Be able to make judgments based on observations, do a variety of tasks, and give directions to others.
- Enjoy working with children.

WORK SETTING

Environment

Work indoors in classrooms, gymnasiums, and offices; some work may be outdoors.

Hours

Work 40 to 50 hours a week usually with two or three months of vacation and holidays; paperwork in the evening and on weekends often necessary.

Employers

Public school systems and private and parochial schools.

CONSIDERATIONS

- Job creates many demands on time and energy often resulting in stress.
- Teachers usually have time during summer vacation to earn extra money, travel, or attend graduate school.
- Working with students may be very rewarding, and teachers have the opportunity to be involved in positive social change.

NEBRASKA EMPLOYMENT

About 8,274 elementary school teachers are projected to be employed by 1991.

WAGES

Starting salaries for elementary school teachers are determined by the salary schedule approved by the governing board. In Nebraska, entry level salaries range between $12,000 and $19,900 a year depending on size and location of the school district. Nationally, starting salaries vary significantly between $16,200 to $26,700 a year.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors
- A shortage of elementary school teachers is expected by the end of the 1980's.
- People with dual majors in elementary education and another area particularly bilingual education or people who seek employment in small towns and rural areas will have better opportunities.

PREPARATION

SKILLS

- Knowledge of teaching methods, learning processes, evaluation techniques, and child development and psychology.
- Knowledge in a variety of subject areas.
- Skills in reading, writing, speaking and persuading.
- Skills in organizing and supervising activities.

LICENSING OR CERTIFICATION

- An elementary school teacher must be certified by the Nebraska Department of Education.
- To be certified, a person must have a bachelors degree, a recommendation from a certification official at an approved college, and six hours of approved credit in the last three years.
- Specialized teachers must also have a subject area endorsement.

TRAINING

- The minimum educational requirement is a bachelors degree in elementary education or in a subject area with additional education courses.
- Some states and school districts require advanced degrees plus certification.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas
311	Fine Arts
314	Music

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in physical education, health, arts and crafts, drama, music, child care, psychology, and sociology.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 68.
Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531.
Occupational Outlook Handbook (1990-91 ed.), p. 132.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2330 SECONDARY SCHOOL TEACHERS

OCCUPATIONAL DESCRIPTION

Secondary school teachers plan and present programs of instruction to students in grades seven through twelve. They demonstrate and explain concepts and skills related to a specific academic subject. They evaluate student progress, prepare and give exams, and arrange class projects. They use a variety of equipment in conducting classes. A teacher must also supervise study halls, homerooms, and after-school activities and attend school meetings. DOT 091.227-010

HOLLAND CODE

SAE (Social, Artistic, Enterprising)

NCIS RELATED OCCUPATIONS

1282	Elementary and Secondary Education Administrators
2033	Recreation Workers
2201	College and University Teachers
2320	Elementary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators
2390	Adult Education Teachers
23901	County Home-Demonstration Agents
23902	Home Economists
23904	Vocational Training Instructors
24011	Counselors
3401	Athletes and Related Workers
34011	Athletic Trainers
34012	Professional Athletes
4795	Teacher Aides

WORK ACTIVITIES

- Instruct students in subject matter using lectures, demonstrations, discussions, and audio-visual aides.
- Develop lesson plans, assign lessons, correct assignments, and administer tests.
- Evaluate students, report progress to parents.
- Counsel students.
- Maintain classroom atmosphere which makes it possible for students to learn.
- Participate in faculty meetings, professional conferences, and inservice training.
- Supervise student activities.

APTITUDES

- Be able to learn teaching methods and subject area content.
- Have verbal ability to read, lecture, write reports, and communicate with teens and adults.
- Be able to keep accurate records, handle detailed paperwork, organize materials and activities, and express ideas.
- Be able to make judgments based on observations and influence students in decision-making situations.
- Have self-confidence and creativity and enjoy working with young people.

WORK SETTING

Environment

Work indoors in classrooms, gymnasiums, and offices.

Hours

Work 40 to 50 hours a week with two to three months of vacation and holidays; paperwork in evenings and on weekends is often necessary.

Employers

Public school systems and private and parochial schools.

CONSIDERATIONS

- Teaching creates many demands on time and energy often resulting in stress.
- Job often includes activities on evenings and weekends, but extra pay may be given for extra school-related responsibilities.
- Teachers often have summers free for travel, study, or extra jobs.
- Working with students may be rewarding and may offer the opportunity to be involved in social change.

NEBRASKA EMPLOYMENT

About 12,474 secondary school teachers are projected to be employed by 1991

WAGES

Starting salaries for secondary school teachers are determined by the salary schedule approved by the governing board. In Nebraska, entry level salaries range between $12,000 and $19,900 a year depending on the size and location of the district. Nationally, starting salaries vary significantly with a range of $16,200 to $26,700 a year.

EMPLOYMENT GROWTH

Nebraska
 Favorable
National
 Somewhat Favorable
Factors

- The supply of new graduates will be somewhat greater than the demand for new teachers, and competition is expected.
- Opportunities are currently more favorable in certain subject areas such as math, science, and special education.
- Employment opportunities are better in small towns or rural areas.

PREPARATION

SKILLS

- Knowledge of one or more subject areas, teaching methods, and evaluation processes.
- Skills in motivation, communication, and counseling.
- Skills in organization, planning, recordkeeping.

LICENSING OR CERTIFICATION

- All secondary teachers must be certified by the Nebraska Department of Education.
- To be certified, a person must have a bachelors degree, a recommendation from a certification official in an approved college, and six hours of approved credit in the last three years.

TRAINING

- The minimum educational requirement is a bachelors degree in education or in a specific subject area with additional education courses.
- Some states and school districts require an advanced degree plus certification.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas
441	English
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a variety of courses for a broad educational background plus as many courses as possible in a specific subject area of interest.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 67.
Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531.
Occupational Outlook Handbook (1990-91 ed.), p. 135.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2350 SPECIAL EDUCATION TEACHERS

OCCUPATIONAL DESCRIPTION

Special education teachers educate and train handicapped persons. They help handicapped people learn skills to aid in performing daily activities, continuing education, or preparing for jobs. They teach in schools, institutions, and programs which provide specialized training.

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Special Education Work-Study Coordinators (094.107-010)
Teachers of Deaf (094.224-010)
Educational Therapists (094.227-010)
Teachers of Blind (094.227-014)
Teachers of Handicapped Students (094.227-018)
Teachers of Mentally Retarded (094.227-022)
Vocational Training Teachers (094.227-026)
Home Therapy Teachers (195.227-018)

NCIS RELATED OCCUPATIONS

1282	Elementary and Secondary Education Administrators
2201	College and University Teachers
2310	Prekindergarten and Kindergarten Teachers
2320	Elementary School Teachers
2330	Secondary School Teachers
2360	Instructional Coordinators
2390	Adult Education Teachers
23904	Vocational and Training Instructors
24011	Counselors
24013	Vocational-Rehabilitation Counselors
3034	Speech Pathologists and Audiologists
4795	Teacher Aides

WORK ACTIVITIES

- Prepare lessons, activities, and other materials.
- Design, adjust, and use special methods or tools.
- Instruct students in academic subjects, self-help skills, language, and prevocational skills.
- Meet with other staff members or professionals.
- Visit homes and meet with parents.
- Prepare individual education plans for each student and record students' progress.
- Work with other staff to provide complete services.
- Give tests and interpret results.

APTITUDES

- Be able to learn teaching methods, content of subjects taught, and principles of special education.
- Have self-confidence, patience, empathy, creativity, and physical energy.
- Have verbal abilities for reading, writing, and communicating with students, parents, and professionals.
- Be able to keep accurate records, handle detailed paperwork, organize materials, and plan activities.
- Be able to make judgments based on observations.
- Enjoy working with handicapped children.
- Be able to supervise teacher aides.

WORK SETTING

Environment

Work indoors in classrooms and offices.

Hours

Work 40 to 50 hours a week; paperwork during evenings and weekends sometimes necessary.

Employers

Public and private residential schools, public schools with specialized classes, hospitals, and government agencies.

CONSIDERATIONS

- Job creates many demands on time and energy and may be stressful, but working with handicapped students may be rewarding.
- Job may require lifting and unpleasant tasks such as changing diapers.
- Teachers usually have free time during summer vacations and holidays.

NEBRASKA EMPLOYMENT

About 2,158 special education teachers are projected to be employed by 1991.

WAGES

Starting salaries for special education teachers are determined by the salary schedule approved by the governing board. In Nebraska, entry level salaries range between $12,000 and $19,900 a year depending on the size and location of the district. Nationally, starting wages vary significantly with a range of $16,200 to $26,700 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- Growing emphasis on special education and government regulations requiring equal public education for all handicapped children may increase the need for these teachers.
- The amount of government funding will determine the number of openings.
- Competition for available positions may be strong in some areas of the country.

PREPARATION

SKILLS

- Knowledge of teaching and rehabilitation methods, theories of learning and the effect of disabilities of learning, and content of subject matter being taught.
- Knowledge of evaluation methods for determining disabilities and special techniques for helping children with disabilities and learning difficulties.
- Skills in using special equipment, vocational training, and arts and crafts.
- Skills in organizing, communicating and supervising.

LICENSING OR CERTIFICATION

- Special education teachers must be certified by the Nebraska Department of Education.
- To be certified, a person must have a bachelors degree, a recommendation from a certification official in an approved college, and six hours of approved credit in the last three years.

TRAINING

- The minimum educational requirement is a bachelors degree.
- Degree options include a dual major in human development and in education, either elementary or secondary, with an endorsement in special education or a major in education with the special education endorsement.
- Some states and school districts require advanced degrees plus certification.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
237	Special Education

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a variety of courses for a broad educational background plus courses in health, physical education, arts and crafts, music, child care, sociology, and psychology.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 68-69.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-518.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2360 INSTRUCTIONAL COORDINATORS

OCCUPATIONAL DESCRIPTION

Instructional coordinators plan, develop, and support educational programs. These programs may be at the primary, secondary, or higher education level. Some plan and set up community education programs, and others develop programs to provide inservice materials for a school system. Some review courses of study or order educational materials for a school system. They work with school officials, teachers, and community groups to make sure that educational standards and goals are met.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Public Health Educators (079.117-014)
Education Consultants (099.167-014)
Instructional Material Directors (099.167-018)
Educational Specialists (099.167-022)
Music Supervisors (099.167-026)

NCIS RELATED OCCUPATIONS

12101	School Superintendents
1281	College and University Administrators
1282	Elementary and Secondary Education Administrators
2201	College and University Teachers
2320	Elementary School Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2390	Adult Education Teachers
23904	Vocational Training Instructors

WORK ACTIVITIES

- Determine the educational needs of schools and communities.
- Set goals to meet determined needs.
- Plan and set up educational programs.
- Prepare and send out information about programs.
- Talk with school and community officials and staff.
- Review courses of study.
- Interpret rules and laws that apply to education.
- Conduct workshops, prepare teaching materials, and design tests to measure effectiveness of programs.
- Order materials, supplies, and visual aides.

APTITUDES

- Be able to learn the principles and methods of education.
- Be able to relate well to people of all ages and educational levels.
- Be able to read large amounts of educational materials.
- Have ability to influence and direct people.
- Be able to make decisions based on experience.

WORK SETTING

Environment

Work indoors in offices, classrooms, and community or educational settings.

Hours

Work 40 or more hours a week; some evening and weekend hours required; some jobs are year-round and some only during the school year.

Employers

Public school systems, private and parochial schools, colleges and universities, vocational and technical schools, community health organizations, large businesses, publishing companies, private educational firms, and government agencies.

CONSIDERATIONS

- This is usually not an entry-level position.

NEBRASKA EMPLOYMENT

About 351 instructional coordinators are projected to be employed by 1991.

WAGES

Entry level salaries for instructional coordinators vary significantly depending on the type and size of employer as well as the academic background, experience, and level of responsibility of the candidate. In Nebraska, starting salaries range between $16,000 and $35,000 a year. Nationally, entry level salaries compare favorably with Nebraska with a range of $20,000 to $36,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Opportunities depend on financial support for schools and continued recognition of the value of educational specialists.
- Demand is growing for educational specialists in large businesses and health fields.

PREPARATION

SKILLS

- Knowledge of educational principles and materials and of various types of educational approaches.
- Skills in communication for reading, writing, and speaking.
- Skills in analysis, organization, and evaluation.
- Knowledge of budget planning and proposal writing.

LICENSING OR CERTIFICATION

- Instructional coordinators must be certified as a teacher or administrator.
- To qualify for an administrative certificate, a person must have a masters degree in educational administration from an approved program.

TRAINING

- An advanced degree in education is usually required.
- Employers desire someone with teaching experience.

EDUCATIONAL PROGRAM

231	Education Administration
234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas
237	Special Education

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a variety of courses for a broad educational background plus courses in composition and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 64 and 70-71.
Guide for Occupational Exploration (2nd ed., 1984), pp. 550-553.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2390 ADULT EDUCATION TEACHERS

OCCUPATIONAL DESCRIPTION

Adult education teachers instruct special, academic, job-related, and other courses in school, business, industrial, and other settings. They may teach one of the variety of popular courses such as consumer education, art, or woodworking. They may teach job-related skills such as assembling watch parts. They plan courses, prepare lessons, and give tests. They may also advise students in career and related matters. DOT 099.227-030

HOLLAND CODE

SER (Social, Enterprising, Realistic)

SPECIALTIES

Extension Work Instructors (090.227-018)
County Home-Demonstration Agents (096.121-010) (23901)
Home Economists (096.121-014) (23902)
County-Agricultural Agents (096.127-010) (23903)
Vocational Training Instructors (097.227-014) (23904)
Tutors (099.227-034)
Technical Training Coordinators (166.167-054)
Technical Training Instructors (166.221-010)
Training Representatives (166.227-010)
Military Trainers (M23900)

NCIS RELATED OCCUPATIONS

2201	College and University Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators
24011	Counselors

WORK ACTIVITIES

- Prepare lesson plans and teaching materials.
- Present lectures, discussions, and programs.
- Give assignments and tests, evaluate students, work, and write progress reports.
- Lead workshops and demonstrations to teach skills.
- Participate in planning of educational programs.

APTITUDES

- Be able to learn teaching methods of adult education.
- Have good verbal and math abilities and space and form perception.
- Be able to keep accurate records, handle detailed paperwork, and plan and organize programs and materials.
- Be able to persuade and communicate with people.
- Be able to make decisions based on observations and personal judgments.

WORK SETTING

Environment

Work indoors in classrooms, offices, meeting rooms, and study centers.

Hours

Work 40 hours a week with some classes during evenings and weekends.

Employers

Adult education programs; technical, vocational, and community colleges; nonprofit organizations; government agencies; industries and businesses; and self-employed.

CONSIDERATIONS

- Adult students are usually highly motivated and may be enjoyable to teach.
- Some jobs offer an opportunity for part-time work.
- There may be a wide variety of subject areas to be taught in adult education.

NEBRASKA EMPLOYMENT

About 3,128 adult education teachers are projected to be employed by 1991.

WAGES

Starting salaries for Adult Education Teachers vary according to the size, location, and sources of funding for the program, agency, or organization. Additional factors which affect the entry level salary include academic background, experience and area of specialization. In Nebraska, entry level salaries range between $12,100 and $20,000 a year. National averages are range between $14,500 and $26,000 a year.

EMPLOYMENT GROWTH

Nebraska
- Favorable

National
- Somewhat Favorable

Factors
- Number of job opportunities will be affected by the amount of government funding available for adult education.
- More interest in learning leisure-time skills, parenting skills, fine arts, and homemaking may add some job opportunities.
- Programs being added by large businesses and companies may increase demands.

PREPARATION

SKILLS

- Knowledge of teaching methods and of the subject matter taught.
- Skills in communication for reading, writing, and speaking.
- Skills in testing, evaluation, and program planning.

LICENSING OR CERTIFICATION

- Some adult education teachers need to be certified in secondary education.

TRAINING

- Training requirements vary widely by state and by subject.
- Some may be only required to have experience in a field where as others may be required to have advanced degrees.
- Many employers require these teachers to have a bachelors degree in adult education or another closely related area of education.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas
392	Individual and Family Development

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a wide variety of courses for a broad educational background.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 67, 69, 70, and 72.

Guide for Occupational Exploration (2nd ed. 1984), pp. 527-531.

Occupational Outlook Handbook (1990-91 ed.), p. 125.

Military Career Guide (1988-89 ed.), p. 116.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

23901 COUNTY HOME-DEMONSTRATION AGENTS

OCCUPATIONAL DESCRIPTION

County home-demonstration agents develop, organize, and conduct programs for individuals in rural communities to improve farm and family life. They coordinate programs with 4-H and agricultural extension agents and community agencies and organizations. Sometimes called county extension home economists. DOT 096.121-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

13512	Food Service Managers
1853	Agricultural and Food Scientists
18533	Food Technologists
2201	College and University Teachers
2310	Prekindergarten and Kindergarten Teachers
2330	Secondary School Teachers
2390	Adult Education Teachers
23902	Home Economists
23904	Vocational Training Instructors
3020	Dietitians
5214	Cooks
5264	Child Care Providers

WORK ACTIVITIES

- Plan and conduct out-of-school educational programs.
- Interpret research findings.
- Help people locate and find solutions to problems.
- Visit homes and give demonstrations.
- Train volunteers, organizations, and clubs.
- Lead training programs for 4-H leaders and members.
- Meet with local planning committees to determine educational programs.
- Use the mass media to present information and educational programs.
- May direct 4-H groups and judge products at contests or fairs.

APTITUDES

- Be able to learn a variety of subjects related to home economics.
- Have good speaking and writing abilities.
- Be able to handle a wide variety of activities, keep records, and plan budgets.
- Be able to advise, direct, plan activities, and organize projects.
- Enjoy working with people of all ages in a variety of settings.
- Be able to influence people by providing information and training and evaluate products to judge their quality.

WORK SETTING

Environment

Work indoors and outdoors; may travel throughout county or area.

Hours

Work 40 hours a week; evening and weekend hours required.

Employers

Employed jointly by the U.S. Department of Agriculture, state and local governments, and land-grant universities.

CONSIDERATIONS

- Extensive travel may be necessary, but mileage is reimbursed.
- Workers must relate to people of various ages, educational backgrounds, and economic systems.
- Work may be rewarding because these workers help to improve the quality of daily life.

NEBRASKA EMPLOYMENT

About 70 county home-demonstration agents are projected to be employed by 1991.

WAGES

In Nebraska, county home-demonstration agents with a bachelors degree start with a range of $12,100 to $20,000 a year depending on the population and amount of services provided in the county. Nationally, entry level salaries compare favorably with Nebraska with a somewhat higher range of $15,000 to $20,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Unfavorable
Factors

- The majority of openings will be to replace present workers who retire or leave the occupation for other reasons.
- Growing awareness of ways these workers help people in nutrition, child care, budgeting, and other areas is helping increase the job opportunities.

PREPARATION

SKILLS

- Knowledge of variety of subject areas and practical skills associated with home economics.
- Skills in communication, leadership training, research, and writing.
- Skills in organization and planning.
- Skills in preparing budgets and proposals.

TRAINING

- The minimum educational requirement is a bachelors degree in home economics.
- An advanced degree is required by some employers.
- One training option is a bachelors degree in home economics with a masters degree in adult education or a home economics specialty.

EDUCATIONAL PROGRAM

235	Teacher Education, Specific Subject Areas
391	Home Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, biology, chemistry, health, and all home economics courses available.

BIBLIOGRAPHY

Dictionary of Occupational Titles(4th ed. 1977) p., 69.
Guide for Occupational Exploration (2nd ed. 1984), pp. 527-531.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

23902 HOME ECONOMISTS

OCCUPATIONAL DESCRIPTION

Home economists organize and conduct consumer education services or research programs for food, textile, utility, or equipment companies. They work to improve products, services, and practices of these companies. They may serve in a variety of capacities including merchandising, public relations, consumer education, communications, financial management, and administration. DOT 096.121-014

HOLLAND CODES

SEA (Social, Enterprising, Artistic)

NCIS RELATED OCCUPATIONS

13512	Food Service Managers
1853	Agricultural and Food Scientists
18533	Food Technologists
2201	College and University Teachers
2330	Secondary School Teachers
23901	County Home-Demonstration Agents
23904	Vocational Training Instructors
3020	Dietitians
5214	Cooks

WORK ACTIVITIES

- Develop new products or services.
- Oversee quality control.
- Plan and prepare promotional materials and programs.
- Prepare newsletters, write advertising copy, and conduct radio and television programs.
- Conduct educational demonstrations and programs.
- Write or edit articles for magazines and newspapers.
- Advise customers.
- Do research.
- Interpret consumer needs to companies.

APTITUDES

- Be able to learn the principles and methods of home economics.
- Have good verbal abilities to use in reading, writing, speaking, and teaching.
- Be good with details, numbers, and space and form perception.
- Be able to relate to people and influence them and to make decisions based on observations.
- Be able to handle a variety of activities.
- Have average coordination and dexterity.

WORK SETTING

Environment

Work indoors in offices, classrooms, laboratories, meeting rooms, homes, and factories; travel may be required.

Hours

Work 40 hours a week; may require evening or weekend hours.

Employers

Utility companies, retail businesses, manufacturers, lending institutions, newspapers, magazines, radio and television stations, hotels, restaurants, advertising firms, government agencies, educational institutions, and product distributors.

CONSIDERATIONS

- Home economics has many areas of application and employment; therefore, home economists usually specialize in a particular area.

NEBRASKA EMPLOYMENT

About 3,128 adult education teachers are projected to be employed by 1991. Home economists are included in this group.

WAGES

Home economists with a bachelors degree may start within a salary range of $12,100 and $20,000 a year depending on the level of responsibilities and the size and location of the employer. Salaries outside Nebraska tend to be somewhat higher with a starting range of $16,000 to $26,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Somewhat Favorable

Factors

- Needs for home economists in the private sector to do research and promotion and to serve as consultants to consumers should add job opportunities.

PREPARATION

SKILLS

- Knowledge of home economics in general and of a specialty area within home economics.
- Skills in teaching, technical writing, public speaking, and public relations.
- Skills in research, planning, and development.

TRAINING

- The minimum educational requirement is usually a bachelors degree in home economics.
- Some employers require an advanced degree.

EDUCATIONAL PROGRAM

235	Teacher Education, Specific Subject Areas
391	Home Economics

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, computer science, sociology, psychology, and home economics.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 69.
Guide for Occupational Exploration (2nd ed., 1984) pp. 527-531.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

23903 COUNTY-AGRICULTURAL AGENTS

OCCUPATIONAL DESCRIPTION

County-agricultural agents provide county residents with technical assistance and educational information related to local agricultural problems. They organize and conduct programs to instruct individuals in applications of agricultural research findings. Sometimes called county extension agents. DOT 096.127-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

1632	Agricultural Engineers
1852	Forestry and Soil Conservation Scientists
18522	Soil Conservationists
1853	Agricultural and Food Scientists
18531	Agronomists
18532	Soil Scientists
2201	College and University Teachers
2390	Adult Education Teachers
23904	Vocational Training Instructors
2701	Veterinarians
5512	General Farmers
5514	Livestock Farmers
5515	Horticultural Farmers

WORK ACTIVITIES

- Collect, analyze, and evaluate research data.
- Advise and help farmers solve problems.
- Give lectures, write articles, and demonstrate procedures.
- Plan programs with government and community representatives.
- Prepare budgets, reports, program records, and proposals.
- Explain technical information and develop special techniques useful to farmers.
- Direct 4-H activities, conduct leadership training programs, and judge products at fairs and contests.

APTITUDES

- Be able to learn a variety of agricultural specialties.
- Be able to communicate with a variety of people and organize ideas and activities.
- Have ability with numbers.
- Be able to advise, direct, and influence others.
- Enjoy working with people and doing a variety of tasks.
- Be self-motivated, willing to serve people, and interested in agriculture.

WORK SETTING

Environment
Work indoors and outdoors.
Hours
Work 40 or more hours a week including evening and weekend hours.
Employers
Employed jointly by the U.S. Department of Agriculture, state and local governments, and land-grant universities.

CONSIDERATIONS

- Work involves travel in rural areas, but mileage is reimbursed.
- Work may take place outdoors in all kinds of weather.

NEBRASKA EMPLOYMENT

About 83 county-agricultural agents are projected to be employed by 1991.

WAGES

In Nebraska, county-agricultural agents with a bachelors degree usually start within a range of $12,100 to $20,000 a year. Outside of Nebraska, entry level salaries range from $15,000 to $20,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Unfavorable
Factors
- Growth is not expected due to budget restrictions.
- Job turnover is very low.

PREPARATION

SKILLS

- Knowledge of farming practices, community and government resources, organization of county extension service, and technical advances and research in agriculture.
- Skills in speaking, writing, and public relations.
- Skills in organization, planning and development, and teaching.

TRAINING

- The minimum educational requirement is a bachelors degree in an area of agriculture.
- Most employers require an advanced degree.
- Coursework in a variety of agricultural and business fields is helpful.

EDUCATIONAL PROGRAM

111	Agricultural Production
112	Animal Sciences
113	Soil Sciences
115	Horticulture and Landscaping
116	Agricultural Management
123	Plant Sciences
235	Teacher Education, Specific Subject Area

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, sociology, agriculture, horticulture, and agribusiness.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 69.
Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
11944	Central Missouri State University
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

23904 VOCATIONAL TRAINING INSTRUCTORS

OCCUPATIONAL DESCRIPTION

Vocational training instructors teach the skills, techniques, and terminology of specific vocational occupations to students in public and private schools or in industrial plants. They use their knowledge of a particular occupation to help students develop or improve job skills. DOT 097.227-014

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

NCIS RELATED OCCUPATIONS

2201	College and University Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2360	Instructional Coordinators
2390	Adult Education Teachers
23901	County Home-Demonstration Agents
23902	Home Economists
23903	County-Agricultural Agents

WORK ACTIVITIES

- Organize training programs, demonstrate job skills, and lecture on theory, practice methods, and processes.
- Plan and supervise the work of students and evaluate that work.
- Locate positions in the community, coordinate training with employers, and visit work sites.
- Counsel students.
- Participate in program planning with other professionals and organizations.
- Attend meetings and supervise out-of-class activities.

APTITUDES

- Be able to learn the methods of teaching vocational skills and the content of a specific subject area.
- Have good space and form perception, general coordination, finger and hand dexterity, and perception of color differences.
- Have good verbal and math abilities and be able to follow written directions.
- Be able to relate well to people.
- Be able to make decisions based on observation.

WORK SETTING

Environment

Work indoors in offices, classrooms, laboratories, and other educational settings; some work outdoors in training areas.

Hours

Work 40 hours a week with some evening and weekend hours.

Employers

High schools, community colleges, vocational and technical trade schools, adult training programs, correctional institutions, industries, rehabilitation centers, hospitals, and college and universities.

CONSIDERATIONS

- Workers in this field may experience satisfaction from helping young people or unemployed adults train for meaningful employment.
- These instructors work with a variety of people on many different levels.

NEBRASKA EMPLOYMENT

About 3,996 vocational training teachers are projected to be employed by 1991.

WAGES

In Nebraska, certified vocational instructors start within a salary range of $14,800 to $20,000 a year. Outside Nebraska, entry level salaries tend to be somewhat higher with a range of $17,000 to $25,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Somewhat Favorable

Factors

- Vocational training instructors will be needed to retrain older workers whose jobs have been eliminated by changing technology and business practices.
- Also adding to demand is the increased participation by adults in part-time instruction.

PREPARATION

SKILLS

- Knowledge of teaching methods and of the technical or vocational subject matter taught.
- Skills in planning, developing, and implementing programs.
- Skills in supervision and evaluation.

LICENSING OR CERTIFICATION

- Vocational teachers in secondary schools must be certified by the Nebraska Department of Education.
- To be certified, a person must have a bachelors degree, a recommendation from a certification official in an approved college, and six hours of approved credit in the last three years.

TRAINING

- Most employers require, at the least, a bachelors degree in vocational education with concentration in a particular vocational area.
- Some instructors may be hired on the basis of their work experience in a particular field even though they do not have college training.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
235	Teacher Education, Specific Subject Areas

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including a variety of courses for a broad educational background plus as many courses as possible in a specific vocational area of interest.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 70.
Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531.
Occupational Outlook Handbook (1990-91 ed.), p. 125.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2401 VOCATIONAL AND EDUCATIONAL COUNSELORS

OCCUPATIONAL DESCRIPTION

Vocational and educational counselors help others to understand themselves better and to apply that understanding toward living and working more effectively. They collect and analyze information about individuals through tests and interviews. Using this information, they advise persons in making and carrying out life decisions.

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Counselors (045.107-010) (24011)
Directors of Counseling (045.107-018)
Residence Counselors (045.107-038) (24012)
Vocational-Rehabilitation Counselors (045.107-042) (24013)
Directors of Guidance in Public Schools (045.117-010)
Foreign-Student Advisers (090.107-010)
Special Services Supervisors (169.267-026)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20321	Social Workers
20322	Probation Officers
20323	Drug and Alcohol Counselors
20324	Case Aides
2201	College and University Teachers
26107	Psychiatrists

WORK ACTIVITIES

- Collect information about people from records, tests, interviews, and other sources.
- Determine people's interests, aptitudes, abilities, and preferences.
- Plan job-training programs.
- Compile and study job, school, and economic information.
- Help people to set work and school objectives.
- Help people understand and overcome their social and emotional problems.
- Conduct in-service training programs for staff.
- Coordinates staffing with teachers, parents, and multidicsciplinary teams.
- Direct testing activities.
- Set guidance policies and procedures.
- Coordinates staffing with teachers, parents, and multidisciplinary teams.

APTITUDES

- Be able to learn counseling theories and techniques.
- Have very good verbal abilities.
- Be able to make decisions based on data, experience, and observations.
- Be able to work well with people in a variety of situations.
- Be able to work with a variety of activities.
- Have good math abilities.
- Be emotionally stable and have desire to help others.

WORK SETTING

Environment
Work indoors in meeting rooms, offices, and classrooms; some home visits are possible.

Hours
Work 40 or more hours a week; some evening and weekend hours possible.

Employers
Educational institutions, employment agencies, large corporations, hospitals, rehabilitation centers, correctional institutions, social service agencies, mental health institutions, government agencies, insurance companies, and self-employed.

CONSIDERATIONS

- Counselors should be accepting of a variety of people with a variety of needs, values, and lifestyles.
- Job may bring satisfaction from helping people grow and develop.

NEBRASKA EMPLOYMENT

About 1,099 educational and vocational counselors are projected to be employed by 1991.

WAGES

Entry level salaries for vocational and education counselors vary significantly depending on the level of education completed and the area of specialization. Wage and salary earnings of rehabilitation and employment counselors tend to be somewhat lower than those of school counselors. Self-employed counselors who have established practices have the highest earnings. In Nebraska, entry level salaries for all counselors range between $15,400 and $28,000 a year. Nebraska salaries parallel entry level salaries throughout the country.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors

- For some counselors the outlook depends on government funding.
- Opportunities are expected to increase because of expansion of the field into industries and businesses.
- The demand for elementary school counselors will increase.

PREPARATION

SKILLS

- Knowledge of counseling theories and methods, testing, interviewing, and principles of human behavior.
- Skills in record keeping and report writing.
- Knowledge of job market and hiring practices.
- Skills in communication.
- Skills in planning, development, and supervision.

LICENSING OR CERTIFICATION

- Vocational and educational counselors may need certification in certain specialties.
- In Nebraska, professional counselors are certified by the Nebraska Board of Examiners in Professional Counseling.
- To be certified, a person must be at least 21 years of age, have a masters degree and three years of full-time experience in professional counseling, and pass an exam.

TRAINING

- The minimum educational requirement is a bachelors degree.
- Most counseling positions require a masters degree.

EDUCATIONAL PROGRAM

141	Human Resources Development
238	Counseling
367	Rehabilitation Services
392	Individual and Family Development
541	Psychology
565	Social Work
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, psychology, sociology, health, and child care.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 48-50, 66, and 107.
Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512.
Occupational Outlook Handbook (1990-91 ed.), p. 130.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings
22307	Central Community College-Platte
21102	Chadron State College
21803	College of Saint Mary
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11935	Drake University
21810	Embry-Riddle Aeronautical University
11903	Emporia State University
21808	Grace College of the Bible
21509	Hastings College
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center

21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

24011 COUNSELORS

OCCUPATIONAL DESCRIPTION

Counselors provide educational and vocational counseling services to individuals and groups. They help students adjust to the academic environment and to cope with situations that might be affecting their performance at school. They also provide career guidance by assisting students and clients in making plans for their future. DOT 045.107-010

HOLLAND CODE

SAE (Social, Artistic, Enterprising)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20322	Probation Officers
20323	Drug and Alcohol Counselors
20324	Case Aides
2042	Clergy
2201	College and University Teachers
2310	Prekindergarten and Kindergarten Teachers
2320	Elementary School Teachers
2330	Secondary School Teachers
2350	Special Education Teachers
2390	Adult Education Teachers
2401	Vocational and Educational Counselors
24012	Residence Counselors
24013	Vocational-Rehabilitation Counselors

WORK ACTIVITIES

- Collect, organize, and analyze information about an individual using records, tests, and interviews.
- Help clients evaluate their interests, aptitudes, abilities, and personal characteristics for vocational and educational planning.
- Collect and study occupational, educational, and economic information.
- Refer people to a placement service or help them find jobs.
- Help individuals understand and solve social and personal problems.
- May conduct research or evaluation techniques.

APTITUDES

- Be able to learn and apply counseling theories and techniques.
- Have verbal abilities to talk with and listen to clients, read professional literature, and write reports.
- Be able to work with a variety of people and have a desire to help others.
- Be able to make judgments based on data, observations, and experience.
- Be able to handle a variety of activities.
- Have good math abilities.
- Be emotionally stable.

WORK SETTING

Environment

Work indoors in offices, classrooms, and meeting rooms; some home visits may be necessary.

Hours

Work 40 hours or more a week with evening and weekend hours possible.

Employers

Educational institutions, employment services, government agencies, private and community organizations, career planning centers, and correctional institutions.

CONSIDERATIONS

- Counselors should be accepting of a variety of people with a variety of needs, values, and lifestyles.

NEBRASKA EMPLOYMENT

About 1,099 educational and vocational counselors are projected to be employed by 1991. Counselors are included in this group.

WAGES

Entry level salaries for vocational and education counselors vary significantly depending on the level of education completed and the area of specialization. Wage and salary earnings of rehabilitation and employment counselors tend to be somewhat lower than those of school counselors. Self-employed counselors who have established practices have the highest earnings.

In Nebraska, entry level salaries for all counselors range between $15,400 and $28,000 a year. Nebraska salaries parallel entry level salaries throughout the country.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors

- Competition is expected to be strong for available positions.
- The number of openings depends on the level of government funding.
- Declining student enrollments limit school counselor openings.
- Funding for programs in the areas of counseling adults in transition and college students making career planning decisions may increase opportunities.

PREPARATION

SKILLS

- Knowledge of counseling techniques, evaluation and test methods, principles of human behavior, and labor market conditions.
- Skills in interviewing, listening, and advising.
- Knowledge of available community resources.
- Skills in reading, speaking, and writing.

LICENSING OR CERTIFICATION

- Counselors may need certification in certain specialties, such as school counseling which requires certification by the Nebraska Board of Education.
- Professional counselors are certified by the Nebraska Board of Examiners in Professional Counseling.
- To be certified, a person must be 21 years of age, have a masters degree and three years of full-time experience in professional counseling, and pass an exam.

TRAINING

- The minimum educational requirement is a bachelors degree in the social sciences.
- Most counseling positions require a masters degree in counseling psychology or guidance and counseling.

EDUCATIONAL PROGRAM

238	Counseling
392	Individual and Family Development
541	Psychology
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, sociology, psychology, health, and child care.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 48.
Guide of Occupational Exploration (2nd ed., 1984), pp. 509-512.
Occupational Outlook Handbook (1990-91 ed.), p. 130.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

24012 RESIDENCE COUNSELORS

OCCUPATIONAL DESCRIPTION

Residence counselors provide individual and group guidance services to students who live in a dormitory. They deal with personal, social, and educational problems and issues. DOT 045.107-038

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

1281	College and University Administrators
1915	Psychologists
2032	Social Workers
20323	Drug and Alcohol Counselors
20324	Case Aides
2401	Vocational and Educational Counselors
24011	Counselors
24013	Vocational-Rehabilitation Counselors

WORK ACTIVITIES

- Conduct programs to orient new students to campus life.
- Supervise dormitory activities and student assistants.
- Investigate reports of student misconduct.
- Hold individual and group counseling sessions.
- Plan and direct informational programs.
- Schedule workers, set dormitory policy, and make room assignments.
- Assist in planning and carrying out institution-wide programs and activities.

APTITUDES

- Be able to learn the theories and methods of student counseling and procedures for residence hall supervision.
- Have strong verbal abilities for use in reading, writing, and speaking.
- Be able to handle a wide variety of activities and make judgments based on observations, intuition, and experience.
- Be able to relate to college students and fellow professionals.
- Be able to influence students.

WORK SETTING

Environment
   Work indoors in offices, meeting rooms, and recreational and living areas.
Hours
   Work 40 or more hours a week; schedule is flexible and includes evening and weekend hours.
Employers
   Public and private colleges and universities and secondary boarding institutions.

CONSIDERATIONS

- Job may bring satisfaction from helping students grow and develop.
- Residence counselors usually live in apartments located within the dormitory; so, their personal lives may be affected by their work.
- Some people work as residence counselors while going to graduate school.

NEBRASKA EMPLOYMENT

About 1,099 vocational and educational counselors are projected to be employed by 1991. Residence counselors are included in this group.

WAGES

Entry level salaries for vocational and education counselors vary significantly depending on the level of education completed and the area of specialization. Wage and salary earnings of rehabilitation and employment counselors tend to be somewhat lower than those of school counselors. Self-employed counselors who have established practices have the highest earnings. In Nebraska, entry level salaries for all counselors range between $15,400 and $28,000 a year. Nebraska salaries parallel entry level salaries throughout the country.

EMPLOYMENT GROWTH

Nebraska
   Favorable
National
   Somewhat Favorable

Factors

- Job opportunities may be somewhat limited because of budget cutbacks and decline in student enrollments.
- People with advanced degrees may find better job opportunities.

PREPARATION

SKILLS

- Knowledge of practices and methods of college-student personnel work and regulations and procedures connected with administering dormitory life.
- Skills in supervision, counseling, program planning, and program presentation.
- Knowledge of community and university resources.

TRAINING

- The minimum educational requirement is a bachelors degree.
- Most employers require a masters degree in counseling or college-student personnel.
- Previous work experience as a student resident assistant is helpful.

EDUCATIONAL PROGRAM

238	Counseling
392	Individual and Family Planning
541	Psychology
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, sociology, psychology, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 49.

Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512.

Occupational Outlook Handbook (1990-91 ed.), p. 130.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

24013 VOCATIONAL-REHABILITATION COUNSELORS

OCCUPATIONAL DESCRIPTION

Vocational-rehabilitation counselors work with physically, emotionally, or mentally disabled individuals. They assist them in developing and carrying out educational and vocational plans. DOT 045.107-042

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

NCIS RELATED OCCUPATIONS

1915	Psychologists
2032	Social Workers
20323	Drug and Alcohol Counselors
20324	Case Aides
2350	Special Education Teachers
2401	Vocational and Educational Counselors
24011	Counselors
24012	Residence Counselors
3032	Occupational Therapists
3034	Speech Pathologists and Audiologists
52332	Occupational Therapy Assistants

WORK ACTIVITIES

- Interview handicapped people and determine whether they meet requirements for aid.
- Determine what jobs would be suitable for people.
- Arrange for clients to train for jobs.
- Help clients get medical services during training.
- Help clients obtain jobs and follow up after placement.
- Help clients with personal adjustments.
- Develop new job openings suitable for handicapped clients.
- Keep records of services provided to clients.

APTITUDES

- Be able to learn methods and principles of vocational rehabilitation counseling.
- Have good verbal and math abilities to use in testing, reading, writing, and speaking
- Be able to handle detailed record keeping and report writing and a variety of work activities.
- Be able to organize and coordinate programs and individual plans for rehabilitation.
- Be able to make decisions based on observations and data.

WORK SETTING

Environment

Work indoors in offices, classrooms, meeting rooms, clinics, homes, or workplaces where clients are placed.

Hours

Work 40 or more hours a week; some evening and weekend hours may be required.

Employers

Hospitals, labor unions, insurance companies, rehabilitation centers, sheltered workshops, community health centers, public and private agencies, and special schools.

CONSIDERATIONS

- Workers may experience personal satisfaction from seeing clients progress, but may also experience disappointment over client's failures.
- Counselors often work with client and family over a period of years.

NEBRASKA EMPLOYMENT

About 1,099 vocational and educational counselors are projected to be employed by 1991. Vocational-rehabilitation counselors are in this group.

WAGES

Entry level salaries for vocational and education counselors vary significantly depending on the level of education completed and the area of specialization. Wage and salary earnings of rehabilitation and employment counselors tend to be somewhat lower than those of school counselors. Self-employed counselors who have established practices have the highest earnings. In Nebraska, entry level salaries for all counselors range between $15,400 and $28,000 a year. Nebraska salaries parallel entry level salaries throughout the country.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Somewhat Favorable
Factors

- Job opportunities in government agencies will vary depending on the funding available.
- More jobs are expected to open in the private sector.
- Opportunities will be best for those with advanced degrees and certification by the Commission on Rehabilitation Counselor Certification.

PREPARATION

SKILLS

- Knowledge of medical and legal aspects of rehabilitation, effects of disability, principles of rehabilitation counseling, and occupational and educational information.
- Skills in counseling, assessment and evaluation, placement and follow-up, and vocational research.
- Skills in report writing and record keeping.

LICENSING OR CERTIFICATION

- Many employers require that these counselors be certified.
- To be certified, a person must meet certain educational and work experience standards set by the Commission on Rehabilitation Counselor Certification and also pass an exam.

TRAINING

- The minimum educational requirement is a bachelors degree in psychology, rehabilitation services, or a related field.
- Most employers require a masters degree in rehabilitation counseling, guidance, or counseling psychology.
- Many of the counselors specialize in a particular rehabilitation area such as work with blind, mentally ill, or chemically dependent clients.

EDUCATIONAL PROGRAM

238	Counseling
367	Rehabilitation Services
541	Psychology
565	Social Work

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, sociology, psychology, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 49.
Guide for Occupational Exploration (2nd ed., 1984), pp. 509-512.
Occupational Outlook Handbook (1990-91 ed.), p. 130.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11935	Drake University
21810	Embry-Riddle Aeronautical University
11903	Emporia State University
21808	Grace College of the Bible
21509	Hastings College
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2510 LIBRARIANS

OCCUPATIONAL DESCRIPTION

Librarians make information available to people. They select, order, catalog, and take care of library materials such as books, magazines, newspapers, films, and records. They also help people find information. Other duties they may perform include supervising staff, preparing budgets, repairing materials, and handling special collections. DOT 100.127-014

HOLLAND CODE

SER (Social, Enterprising, Realistic)

SPECIALTIES

Branch or Department Chief Librarians (100.127-010)
Audiovisual Librarians (100.167-010)
Bookmobile Librarians (100.167-014)
Children's Librarians (100.167-018)
Institutional Librarians (100.167-022)
Special Library Librarians (100.167-026)
School Library Media Specialists (100.167-030)
Special Collections Librarians (100.267-014)

NCIS RELATED OCCUPATIONS

2520	Archivists and Curators
4694	Library Clerks

WORK ACTIVITIES

- Examine, classify, and organize books and other materials for cataloging system.
- Select and buy books and materials.
- Recommend and locate books and other materials.
- Find answers to reference questions.
- Assist people in using the catalog system, reference materials, and audiovisual equipment.
- Help patrons check out and return materials.
- Arrange book displays, file cards, and compile lists.
- Keep circulation records.
- Plan and carry out special programs.
- Obtain information using special equipment such as computers, microfilm, and microfiche machine.

APTITUDES

- Be able to learn the library system and broad areas of knowledge.
- Have good ability with numbers.
- Have verbal abilities in reading, writing, and speaking.
- Be able to work with a variety of people.
- Have good space and form perception, physical coordination, and sense of color.
- Be able to make judgments based on observation, evaluation, and data.

WORK SETTING

Environment
Work indoors in libraries or media centers.
Hours
Work 35 to 40 hours a week; schedule may be flexible with evening and weekend hours.
Employers
Government agencies, educational institutions, hospitals, historical societies and museums, large corporations, orchestras, bookstores, law firms, and special libraries.

CONSIDERATIONS

- Librarians work with a variety of people.
- Reaching and light lifting may be necessary.

NEBRASKA EMPLOYMENT

About 1,292 librarians and audiovisual specialists are projected to be employed by 1991.

WAGES

In Nebraska, the entry level salary range for all librarians with a minimum of a bachelors degree is $15,000 to $23,100 a year. Librarians with a masters degree will command starting salaries at the upper end of the scale. Entry level salary figures for Nebraska are equal to national salary figures.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Unfavorable

Factors

- Most openings will be replacement positions.
- The supply of library science graduates is greater than the demand.
- Opportunities are best for librarians with scientific or technical backgrounds and data processing skills.

PREPARATION

SKILLS

- Knowledge of library classification systems, reference tools and sources, and library science methods.
- Skills in supervision, public relations, reading, research, and clerical tasks.
- Skills in organizing and following written and oral directions.
- Broad knowledge of various subjects.

LICENSING OR CERTIFICATION

- School librarians must be certified by the Nebraska Department of Education.
- To be certified, a person must have a bachelor's degree in library or media science or in education with an endorsement in media.

TRAINING

- Most employers and states require a masters degree in library science.
- Some educational institutions will employ a librarian with a bachelors degree in education with an endorsement in media.
- School librarians or media specialists must meet teacher certification requirements.

EDUCATIONAL PROGRAM

234	Teacher Education, General Programs
441	English
448	Liberal Arts and Sciences
461	Library Science
581	Social Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, literature, journalism, foreign language, history, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 72-73.

Guide for Occupational Exploration (2nd ed., 1984), pp. 527-531.

Occupational Outlook Handbook (1990-91 ed.), p. 133.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2520 ARCHIVISTS AND CURATORS

OCCUPATIONAL DESCRIPTION

Archivists and curators do research on items or materials of scientific or historical interest. They appraise, edit, and direct the safekeeping of records, historical documents, art objects, and other valuable or rare items. Some plan and direct the major activities of a museum, art gallery, arboretum, or similar institution. Others work to restore or repair articles and prepare them to be exhibited. DOT 101.167-010, 102.017-010

HOLLAND CODE

SER (Social, Enterprising, Realistic)

SPECIALTIES

Historic Sites Supervisors (102.117-010)
Museum or Zoo Directors (102.117-014)
Art Conservators (102.167-010)
Conservation Technicians (102.261-010)
Museum Technicians (102.381-010)
Research Associates (109.067-014)
Research Assistants (109.267-010)
Encyclopedia Research Workers (109.267-014)
Museum Attendants (109.367-010)

NCIS RELATED OCCUPATIONS

1919	Social Scientists
19191	Anthropologists
2510	Librarians
4694	Library Clerks

WORK ACTIVITIES

- Appraise and prepare descriptions of valuable objects and documents.
- Plan special research projects.
- Maintain collections, catalog information, preserve documents and objects, and microfilm materials.
- Arrange public displays.
- Request and solicit materials for collections.
- Plan and direct activities of the institution.
- Supervise and hire staff.
- Arrange for loan of collections.
- Help patrons doing research.
- Provide instructional workshops and prepare educational materials.
- Repair and clean objects.
- Write articles for journals.
- Plan budgets and money-raising projects.

APTITUDES

- Be able to learn principles and methods used by archivists and curators.
- Have high verbal abilities in reading, writing, and speaking.
- Have good ability with numbers.
- Be able to handle detailed paperwork, supervise workers, and plan projects.
- Be able to make decisions based on data and observations.
- Have good space and form and color perception.
- Be able to relate to people and handle a variety of tasks.

WORK SETTING

Environment

Work indoors in offices, library areas, and display, work, and storage rooms and outdoors at archeological, historical, and collection sites and botanical gardens.

Hours

Work 35 to 40 hours a week with longer hours possible for special projects; schedules may be flexible with evening or weekend hours.

Employers

State and county historical societies, government agencies, libraries, non-profit organizations, churches, businesses, museums, art galleries, zoos, botanical gardens, and universities.

CONSIDERATIONS

- Job carries prestige.
- Workers may be exposed to dust, fumes, or unpleasant odors.
- Workers may concentrate on one area of activities such as research, collections management, or exhibit preparation.
- These workers should be interested in preserving and interpreting human history.

NEBRASKA EMPLOYMENT

About 147 curators and archivists are projected to be employed by 1991.

WAGES

Entry level salaries for archivists and curators vary considerably depending on the type and size of employer. Salaries in the Federal Government tend to be much higher than those in religious or other non-profit organizations. The average salaries of curators of large well-endowed museums may be several times higher than those in smaller ones. Starting salaries in Nebraska compare favorably with salaries throughout the country with a range of between $16,100 to $24,900 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Unfavorable
Factors
- Recently, government funding has decreased.
- Many institutions have reduced full-time employees to part-time positions.
- Opportunities are best for those with work experience and proven skills.

PREPARATION

SKILLS

- Knowledge of historical research methods, archival classification methods, and curatorial procedures.
- Skills in management, supervision, and planning and development.
- Skills in speaking and scholarly writing.
- Skills in organization and recordkeeping.
- Knowledge of legal and government procedures.

TRAINING

- The minimum educational requirement is a bachelors degree in a related area of specialty such as art, history, zoology, or archeology.
- Most employers require an advanced degree.
- Course work in foreign languages, economics, and library science is helpful.

EDUCATIONAL PROGRAM

461	Library Science
581	Social Sciences
582	Anthropology
585	History

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, literature, speech, history, sociology, biology, art, computer science, and foreign language.

BIBLOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 73-74.
Guide for Occupational Exploration (2nd ed., 1984), pp. 100-107, 532-535, and 550-553.
Occupational Outlook Handbook (1990-91 ed.), p. 126.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21303	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2610 PHYSICIANS

OCCUPATIONAL DESCRIPTION

Physicians diagnose, prevent, and treat diseases and injuries. Their job involves gathering and analyzing information about the patient's condition. Based on this analysis, the physicians determine a course of procedures to follow. They discuss and explain problems and counsel their patients. They also advise patients on how to prevent disease and keep fit through proper diet and exercise. Some do research, teach in medical schools, or write and edit medical books.

HOLLAND CODE

IRS (Investigative, Realistic, Social)

SPECIALTIES

Pathologists (070.061-010) (26101)
Anesthesiologists (070.101-010) (26109)
Cardiologists (070.101-014)
Dermatologists (070.101-018)
General Practitioners (070.101-022)
Family Practitioners (070.101-026)
Gynecologists (070.101-034) (26102)
Internists (070.101-046) (26103)
Neurologists (070.101-050)
Obstetricians (070.101-054)
Ophthamologists (070.101-058) (26104)
Pediatricians (070.101-066) (26105)
Radiologists (070.101-090)
Surgeons I (070.101-094) (26106)
Urologists (070.101-098)
Allergist-Immunologists (070.107-010)
Psychiatrists (070.107-014) (26107)
Osteopathic Physicians (071.101-010) (26108)
Military Physicians and Surgeons (M26100)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patients using medical instruments such as stethoscopes and blood pressure gauges.
- Arrange for or perform a series of tests.
- Prescribe suitable treatment or refer patients to medical specialtists.
- Carry out and supervise medical treatments.
- Advise and counsel patients.
- Supervise medical records for accuracy.
- Visit patients in hospital.
- Supervise other staff.
- May plan and implement research projects.
- Read and study medical journals.
- Many perform minor surgery and child delivery.

APTITUDES

- Be able to learn complex science, math, and methods and techniques of medicine.
- Have strong verbal abilities in reading, writing, and speaking.
- Have good space and form perception, finger and hand dexterity, and general coordination.
- Be able to plan, organize, and direct others. Be able to relate to all kinds of people.
- Be able to make decisions based on data, observations, and experience.
- Have a scientific curiosity, emotional maturity, and empathy.

WORK SETTING

Environment
Work indoors in offices, clinics, treatment rooms, hospitals, laboratories, and surgical areas.

Hours
Work 40 to 60 hours a week; schedule may be irregular and include evening and weekend hours, and holidays.

Employers
Hospitals, universities and medical centers, clinics, health maintenance organizations, government agencies, large corporations, research laboratories, group practices, and self-employed in private practice.

CONSIDERATIONS

- Physicians are subject to pressure such as when case loads are heavy or when immediate diagnosis is necessary.

- Work may provide personal satisfaction.
- Job carries prestige.
- Hours and responsibilities place stress on family life.

NEBRASKA EMPLOYMENT

About 2,642 physicians and surgeons are projected to be employed by 1991.

WAGES

Physicians have among the highest annual earnings of any occupational group. Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Earnings for general practitioners tend to fall at the lower end of the scale while earnings for plastic, orthopedic, and neurosurgeons tend to reach the upper end of the scale. Self-employed physicians tend to earn little more than the minimum needed to pay expenses for the first year or two. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors

- Growing demand is influenced by the increasing population, longer life expectancies, rising health consciousness, and growing number of people covered by insurance.
- Job opportunities are greater in rural areas and small towns.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Skills in diagnosis and treatment of disease and performing surgery.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application in medicine.
- Ability to relate to patients, families, and other staff.
- Skills in decision making.

LICENSING OR CERTIFICATION

- Physicians must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must be a graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.

TRAINING

- Graduation from an accredited school of medicine followed by three to seven years of residency training is required.
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects, pass a preadmissions test called the New Medical College Admissions Test, and have a high grade-point average.

EDUCATIONAL PROGRAM

363	Medicine
374	Podiatry
524	Chemistry
531	Life Sciences
541	Psychology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, anatomy, physics, health, accounting, computer science, sociology, and psychology.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 52-54.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.
Military Career Guide (1988-89 ed.), p. 279.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University

21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26101 PATHOLOGISTS

OCCUPATIONAL DESCRIPTION

Pathologists study the nature, cause, and development of diseases and structural and functional changes caused by them. DOT 070.061-010

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

NCIS RELATED OCCUPATIONS

1854	Biological Scientists
18541	Biochemists
18544	Microbiologists
1855	Medical Scientists
2610	Physicians
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physicians Assistants
5233	Health Aides

WORK ACTIVITIES

- Collect body tissue, fluids, secretions, and other specimens.
- Apply laboratory procedures to specimens.
- Diagnose presence and state of disease.
- Act as consultant to other medical practitioners.
- Perform autopsies to determine nature and extent of disease, cause of death, and effects of treatment.
- May direct activities of pathology department.

APTITUDES

- Be able to learn complex science, math, and the methods and techniques of laboratory procedures.
- Have strong numerical and verbal abilities.
- Have good space and form perception, finger and hand dexterity, and ability to pay attention to details.
- Be able to plan and organize and direct others.
- Have scientific curiosity.
- Be able to make decisions based on data, observations, and experience.

WORK SETTING

Environment
    Work indoors.
Hours
    Work 40 to 60 hours a week.
Employers
    Hospitals, universities and medical centers, clinics, health maintenance organizations, laboratories, and government agencies.

CONSIDERATIONS

- Personal satisfaction may come from solving commuity health problems and determining causes of illnesses.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Pathologists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,00 a year depending on specialty, geographic location, skill, and type of practice. Pathologists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Favorable

Factors

- Growth in population, longer life spans, and increases in the number of tests used may add to the need for these physicians.

PREPARATION

SKILLS

- Knowledge of pathology, physiology, microbiology, biochemistry, and general medicine.
- Knowledge of the specialized aspects of pathology and laboratory procedures.
- Skills in assessment of needs and diagnosis of illnesses.
- Skills in using laboratory equipment.
- Skills in interpreting laboratory tests and results.
- Skills in supervising others and relating to a variety of people.

LICENSING OR CERTIFICATION

- Pathologists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery in order to practice.
- To be licensed, a person must be a graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.

TRAINING

- Graduation from an accredited school of medicine is required.
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- After medical school, these doctors must serve a three- to five-year residency specializing in pathology before being licensed to practice.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in biology, chemistry, anatomy, health, health occupations, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed. 1977), p. 53.

Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.

Occupational Outlook Handbook (1990-91 ed.), p. 165.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26102 GYNECOLOGISTS

OCCUPATIONAL DESCRIPTION

Gynecologists diagnose and treat diseases and disorders of female, urinary, and rectal organs. DOT 070.101-034

HOLLAND CODE

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patients using various medical instruments.
- Order or carry out tests to gather information.
- Analyze findings of tests and examine and diagnose the disorder or disease.
- Discuss problem with patient.
- Prescribe treatment, medication, exercise, or hygiene routine.
- Perform surgery.
- Care for patients throughout pregnancy and deliver babies.
- Supervise staff and recordkeeping.

APTITUDES

- Be able to learn complex science, math, and the methods and techniques of practicing medicine.
- Have strong verbal abilities to read technical materials, write medical reports, and communicate with patients and staff.
- Have good space and form perception, finger and hand dexterity, and ability to pay attention to details.
- Be able to plan and organize and direct others.
- Have scientific curiosity, emotional stability, and empathy.
- Be able to make decisions based on data, observations, and experience.
- Be able to relate to all kinds of people.

WORK SETTING

Environment

Work indoors in offices, clinics, treatment rooms, hospitals, delivery rooms, laboratories, and surgical areas.

Hours

Work 40 to 60 hours a week; schedule is irregular with evening and weekend hours.

Employers

Hospitals, universities and medical centers, clinics, health maintenance organizations, government agencies, group practices, family planning agencies, and self-employed in private practice.

CONSIDERATIONS

- Serving women's medical needs and bringing babies into the world may provide personal satisfaction.
- Gynecologists may often be on call all hours to deliver babies on short notice.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Gynecologists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Gynecologists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Favorable
Factors

- Growth in population and longer life spans may add to the need for these physicians.
- In Nebraska, more gynecologists are needed in rural areas and small towns than in larger cities.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Knowledge of specialized aspects of gynecology and obstetrics.
- Skills in assessment of needs and diagnosis and treatment of illnesses and injuries.
- Skills in surgery and delivery of babies.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application to medicine.
- Ability to relate to patients, families, and other staff.

LICENSING OR CERTIFICATION

- Gynecologists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery in order to practice.
- To be licensed, a person must graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.
- Gynecologists may also be certified by the American College of Obstetricians and Gynecologists by meeting certain continuing education and experience requirements and by passing an exam.

TRAINING

- Graduation from an accredited school of medicine is required (most students take four years to finish medical school).
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- After medical school, these doctors must serve a three-year residency, specializing in gynecology, obstetrics, before being licensed to practice.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, health, home economics education, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 53.

Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.

Occupational Outlook Handbook (1990-91 ed.), p. 143.

SCHOOLS

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21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26103 INTERNISTS

OCCUPATIONAL DESCRIPTION

Internists diagnose and treat diseases and injuries of human internal organ systems. DOT 070.101-042

HOLLAND CODE

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patient for symptoms of disorders.
- Decide the nature and extent of injury or disorder using a variety of aids and tests.
- Discuss problem with patient.
- Prescribe treatment, medications, diet, or activities.
- Refer patient to surgery if needed.
- Supervise and follow up on patient treatment.
- Oversee other staff and recordkeeping.
- Read and study to stay abreast of new medical developments.

APTITUDES

- Be able to learn complex science and math and the methods and techniques of practicing medicine.
- Have strong verbal abilities to read technical materials, write reports, and communicate with patients and other professionals.
- Have good space and form perception, finger and hand dexterity, and overall coordination.
- Be able to plan and organize and direct others.
- Be able to make decisions based on data, observation, and experience.
- Have good math ability.

WORK SETTING

Environment

Work indoors in offices, clinics, treatment rooms, hospitals, laboratories, and surgical areas.

Hours

Work 40 to 60 hours a week; schedules may be irregular and include weekend and evening hours; may be on call frequently.

Employers

Hospitals, universities and medical centers, clinics, health maintenance organizations, government agencies, group practices, self-employed in private practice, and research centers.

CONSIDERATIONS

- Doctors may find this kind of medicine personally satisfying.
- Job carries prestige.
- These doctors often face deaths of their critically ill patients.
- Doctors may feel stress from heavy workloads and demands for immediate diagnoses.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Internists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Internists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors

- Growth in population and longer life spans may add to the need for these physicians.
- In Nebraska, more internists are needed in small or medium-sized towns than in larger cities.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Knowledge of specialized aspects of internal medicine and one or more of its specialties.
- Skills in assessment of needs and diagnosis and treatment of internal diseases and injuries.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application to medicine.
- Ability to relate to patients, families, and other staff.

LICENSING OR CERTIFICATION

- Internists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.

TRAINING

- Graduation from an accredited school of medicine is required (most students take four years to finish medical school).
- To be admitted to medical school, a person must complete three to four years of pre-medicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- After medical school, internists must serve a three-year residency, specializing in internal medicine.
- Internists often specialize in internal medicine areas such as pulmonary medicine, diabetes, or cancer.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, health, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 53.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

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21819	University of Nebraska Medical Center
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21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26104 OPHTHALMOLOGISTS

OCCUPATIONAL DESCRIPTION

Ophthalmologists diagnose and treat diseases and injuries of the eyes. They are qualified physicians with additional training in the treatment of eye diseases and disorders. DOT 070.101-058

HOLLAND CODE

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patients for symptoms showing disorders or injuries.
- Use charts, special equipment, and tests to determine the extent of disease or injury.
- Discuss problem with patient.
- May perform eye surgery and prescribe drugs or other eye treatment, as well as lenses.
- Advise patients on proper eye care and methods of disease prevention.
- Maintain accurate medical records and supervise staff.

APTITUDES

- Be able to learn complex science, math, and methods and techniques of practicing medicine.
- Have high verbal abilities to understand medical literature, communicate with people, and write reports and diagnoses.
- Have numerical ability to conduct complex tests and prescribe corrective glasses.
- Have good space and form perception, hand and finger dexterity, and sense of color.
- Be able to make decisions based on data, experience, and observations.
- Be able to relate to people and supervise others.

WORK SETTING

Environment

Work indoors in offices, clinics, treatment rooms, hospitals, laboratories, and surgical areas.

Hours

Work 40 to 70 hours a week; schedule may be irregular and include evening and weekend hours; may be on call frequently.

Employers

Hospitals, universities or medical centers, clinics, health maintenance organizations, government agencies, group practices, self-employed in private practice, and professional organizations.

CONSIDERATIONS

- Job carries prestige and offers satisfaction from helping others.
- Although ophthalmologists may earn less than other medical specialists, their practice often offers more regularity in hours and patients.
- Setting up a beginning private practice may be costly, but an ophthalmologist has high earning potential after becoming established.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Ophthalmologists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Ophthalmologists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Somewhat Favorable
Factors

- The population is growing and people are living longer causing a need for more ophthalmologists.
- Those seeking to establish their own private practices are experiencing increasing competition.
- There may be better opportunities in rural areas or small towns and in salaried positions in government agencies, clinics, and research facilities.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Knowledge of specialized aspects of ophthalmology.
- Skills in diagnosis and treatment of eye injuries and diseases.
- Ability to relate to patients, families, and other staff.
- Knowledge of laboratory tests and their interpretation and medical drugs and their use.

LICENSING OR CERTIFICATION

- Ophthalmologists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.
- Ophthalmologists also may take the certification exam given by the American Board of Ophthalmology or the American Osteopathic Board of Ophthalmology.

TRAINING

- Graduation from an accredited school of medicine is required (most students take four years to finish medical school).
- To be admitted to medical school, a person must complete three to four years of premedicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- Ophthalmologists must serve three to four years of specialized residency in ophthalmology after graduation from medical school.
- Some states require a year of specialized internship.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, anatomy, psychology, sociology, health, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 53.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

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22517	York College

26105 PEDIATRICIANS

OCCUPATIONAL DESCRIPTION

Pediatricians plan and carry out medical care programs for children from birth through adolescence. These programs are to aid in mental and physical growth and development. DOT 070.101.066

HOLLAND CODE

ISE (Investigative, Social, Enterprising)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patient for disease or injury using medical instruments and tests.
- Make diagnosis and discuss problem with patient and family.
- Prescribe suitable treatment or medication.
- Monitor on-going development and growth.
- Set up routine for preventing disease.
- Maintain medical records and supervise staff.
- Perform basic surgeries.

APTITUDES

- Be able to learn complex sciences, math, and methods and techniques of pediatric medicine.
- Have strong verbal abilities to read technical materials, write medical reports, and communicate with patients and other medical professionals.
- Have good space and form perception, finger and manual dexterity, and overall coordination.
- Be able to plan and organize and direct others.
- Have good math ability to understand lab results.
- Be able to make decisions based on data, observations, and experience.
- Be able to relate to people.

WORK SETTING

Environment

Work indoors in offices, clinics, treatment rooms, hospitals, laboratories, surgical areas, and emergency rooms.

Hours

Work 40 to 60 hours a week; schedule may be irregular with evening and weekend hours; may be on call frequently.

Employers

Hospitals, universities and medical centers, clinics, health maintenance organizations, government agencies, group practices, self-employed in private practice, and research centers.

CONSIDERATIONS

- Job carries prestige.
- Pediatricians may find working with children and teenagers to be personally rewarding.
- They must be prepared to face serious illness and death of some children.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Pediatricians are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Pediatricians are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Favorable
Factors

- Although present lowering of the birth rate may decrease the number of potential pediatric patients, pediatricians are needed because of an increased interest in childhood diseases and growth and development.
- In Nebraska, there is a greater need for pediatricians in rural areas and small towns than in larger cities.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Knowledge of specialized aspects of pediatrics and developmental stages of children and teens.
- Skills in diagnosis, treatment, and performing basic surgery.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application to medicine.
- Ability to relate to children and teenagers, their parents, and other staff.
- Skills in decision making, supervision, and recordkeeping.

LICENSING OR CERTIFICATION

- Pediatricians must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must be a graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.
- Pediatricians may also be certified by the American Academy of Pediatrics by meeting certain continuing education and experience requirements and passing an exam.

TRAINING

- Graduation from an accredited school of medicine is required (most students take four years to finish medical school).
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- After medical school, pediatricians must serve a three-year residency specializing in pediatrics before becoming licensed.
- Pediatricians may specialize in areas such as respiratory diseases or children's cancer.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, anatomy, health, sociology, psychology, child care, and computer sciences.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 53.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

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26106 SURGEONS I

OCCUPATIONAL DESCRIPTION

Surgeons do surgery to correct deformities, fix injuries, prevent diseases, and improve function in patients. DOT 070.101-094)

HOLLAND CODE

IRA (Investigative, Realistic, Artistic)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patient to see if operation is needed, estimate risk to patient, and decide best procedures.
- Review reports of patient's condition and medical history.
- Examine instruments, equipment, and surgical setup.
- Perform surgery using a variety of instruments and techniques.
- May supervise recovery from surgery.
- May specialize in certain types of surgery.
- Maintain records and supervise staff.

APTITUDES

- Be able to learn complex science, math, and the methods and techniques of practicing medicine.
- Have very good finger and manual dexterity, space and form perception, and overall coordination.
- Have strong verbal ability to read technical materials, write medical reports, and communicate with patients and other staff.
- Be able to coordinate activities in surgery, direct others, and plan procedures.
- Have good math ability to understand lab results.
- Be able to make decisions based on data, observations, and experience.
- Be calm under pressure and display qualities of poise and accuracy.

WORK SETTING

Environment

Work indoors in hospitals, surgical rooms, exam and treatment rooms, offices, and clinics.

Hours

Work 40 to 60 hours a week; may be called on to perform emergency surgery on evenings, weekends and holidays.

Employers

Hospitals, universities and medical centers, health maintenance orgnaizations, group practices, and self-employed in private practices.

CONSIDERATIONS

- Surgeons may find their work personally satisfying because surgery offers opportunity to be involved in life-saving measures for critically ill or injured patients.
- Surgeons must be prepared to face death of their patients.
- Some surgical procedures place the surgeon at risk for contraction of blood transmitted diseases.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Surgeon I's are included in this group

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Surgeons I are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors
- Longer life spans and greater awareness of health care needs may add to the demand for surgeons.
- In Nebraska, there is a greater need for surgeons in small towns and medium-sized cities than in larger cities.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general medicine.
- Knowledge of techniques and procedures used in surgery, including sterilization methods and use of surgical instruments.
- Skills in diagnosis of illness.
- Knowledge of laboratory tests and medical drugs and their use before, during, and after surgery.
- Ability to relate to patients and their families, nurses, and other physicians on the surgical team, and other health care professionals.
- Skills in recordkeeping and supervising others.

LICENSING OR CERTIFICATION

- Surgeons must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must be a graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.
- Surgeons may also be certified by the American College of Surgeons by meeting certain continuing education and experience requirements and passing an exam.

TRAINING

- Graduation from an accredited school of medicine is required, usually taking four years to complete.
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects and pass a preadmission test called the New Medical College Admission Test.
- After medical school a surgeon I must serve a five-year residency specializing in surgery before becoming licensed.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS •

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, psychology, sociology, health, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 54.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

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26107 PSYCHIATRISTS

OCCUPATIONAL DESCRIPTION

Psychiatrists provide psychotherapy for the physical, mental, and occupational rehabilitation of patients. DOT 070.107-014

HOLLAND CODE

ISA (Investigative, Social, Artistic)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
1915	Psychologists
20323	Drug and Alcohol Counselors
2401	Vocational and Educational Counselors
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Study, diagnose, and treat mental, emotional, and behavioral disorders.
- Organize information about patient's family, personal history, and symptoms.
- Examine patient to determine general physical condition.
- Order lab tests and evaluate results.
- Determine the type of mental illness and set up a treatment program.
- Treat patients using medication, psychotherapy, group therapy, or other methods.
- May treat diseases of the brain and nervous system and also be called a neurologist.
- Maintain medical records and supervise other staff.
- May specialize in child or adolescent psychiatry.

APTITUDES

- Be able to learn complex science and math and medical psychiatric practices.
- Have high verbal ability to understand medical literature, communicate with people, and write reports.
- Have numerical ability to carry out and interpret tests.
- Have good space and form perception.
- Be able to work well with people.
- Be able to direct treatment programs, supervise staff, and make judgments based on data, observation, and experience.
- Have emotional stability, tolerance, objectivity, self-confidence, and patience.

WORK SETTING

Environment
Work indoors in offices, clinics, hospitals, and treatment rooms.

Hours
Work 40 to 48 hours a week with some evening hours required.

Employers
Hospitals, clinics, universities and medical schools, mental health agencies, government agencies, group practices, health maintenance organizations, and self-employed in private practice.

CONSIDERATIONS

- Job carries prestige and often offers satisfaction from helping others.
- Job involves major responsibilities and may include heavy caseloads.
- Setting up a beginning private practice may be costly but psychiatrists have high earning potential after becoming established.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Psychiatrists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Psychiatrists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT OUTLOOK

Nebraska
    Unfavorable
National
    Favorable
Factors

- Growing awareness of mental health needs is causing more people to seek therapy.
- Many health insurance companies now will pay for counseling treatment which may increase the demand for psychiatrists.
- There is an increasing number of graduates and competition may be strong.
- Opportunities are best in large cities or in specialties such as child psychiatry.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, current medical practices, and psychotherapeutic methods.
- Skills in diagnosis and treatment of mental disease.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application in medicine.
- Skills in decision making, recordkeeping, and supervision.
- Ability to relate to patients, families, and other staff.

LICENSING OR CERTIFICATION

- Psychiatrists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must be a graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.
- Psychiatrists may also be certified by the American Broad of Psychiatry and Neurology or the American Osteopathic Board of Neurology and Psychiatry by completing at least two additional years of clinical experience and passing an exam.

TRAINING

- Graduation from an accredited medical school is required which usually takes four years.
- To be admitted to a medical school, a person must complete three to four years of pre-medicine subjects, pass an preadmission test called the New Medical College Admission Test, and have a high grade-point average.
- After graduation from medical school, psychiatrists must serve a three-year residency in psychiatry.
- Undergraduates should study psychology to prepare for psychiatry.
- Previous work experience in a psychiatric hospital is helpful.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences
541	Psychology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, sociology, psychology, health, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 54.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College

21810	Embry-Riddle Aeronautical University
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26108 OSTEOPATHS

OCCUPATIONAL DESCRIPTION

Osteopaths diagnose, prescribe for, and treat all diseases of the human body. They evaluate and treat individuals as entire systems. They are concerned not only with the disease but also with the patient's ability to adapt to internal and external stresses. Osteopathic procedures attempt to restore normal functioning of poorly operating structures through special skills of manipulation. DOT 071.101-010

HOLLAND CODE

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patient for symptoms of disorders using medical instruments, laboratory tests, x-rays, plus examination of musculo-skeletal system.
- Diagnose and treat disorders using all of the usual medical means plus manipulative therapy.
- Advise patients on proper methods of health care and disease prevention.
- Maintain medical records.
- Supervise office and staff.

APTITUDES

- Be able to learn complex science and math and the scientific elements and methods of medical and osteopathic care.
- Have strong verbal ability to read technical materials, write medical reports, and communicate with patients and other medical professionals.
- Be able to pay attention to small details, keep records, and do detailed paperwork.
- Be able to relate to all kinds of people.
- Be able to make decisions based on data, observation, and experience.
- Have self-confidence and emotional maturity.

WORK SETTING

Environment

Work indoors in offices, clinics, treatment and examination rooms, hospitals, and laboratories.

Hours

Work 40 to 60 hours a week; schedule may be irregular and include evening and weekend hours and being on call.

Employers

Hospitals, medical centers, clinics, government agencies, research laboratories, group practices, and self-employed in private practice.

CONSIDERATIONS

- Osteopaths may find caring for people's health care needs and promoting good health to be personally satisfying.
- Most osteopathic physicians are involved in general or family practice.
- Most of these doctors work in osteopathic hospitals, but the number of joint hospitals where doctors of osteopathy (D.O.'s) and medical doctors (M.D.'s) work together is increasing.
- Osteopaths emphasize prevention of disease and treating the patient in a holistic way and looking at the body as an interrelated system.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Osteopaths are a part of this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Osteopaths are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors

- The osteopathic profession is gaining a wider acceptance among the general public which may add to the need for these doctors.
- Best opportunities exist in rural areas, small towns, and city suburbs, especially in states which osteopathic medicine is widely accepted as a method of treatment.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, microbiology, biochemistry, pathology, and general osteopathic medicine.
- Knowledge of the musculo-skeletal system and how it works.
- Skills in providing manipulation techniques for the musculo-skeletal system.
- Skills in diagnosis of illness and planning of treatment programs.
- Knowledge of laboratory tests and their interpretation, medical drugs and their use, and nutrition and its application to medical treatment.
- Skills in instructing patients in disease prevention and health maintenance procedures.
- Ability to relate to patients, families, and staff.

LICENSING OR CERTIFICATION

- Osteopaths must be licensed by the Nebraska Bureau of Examiners in Medicine and Surgery.
- To be licensed, a person must be a high school graduate, graduate from an accredited school of osteopathy, and pass an exam.

TRAINING

- Graduation from an osteopathic school is required which usually takes three to four years.
- To be admitted to a college of osteopathic medicine, a person must complete three to four years undergraduate education, have a high grade-point average, and pass the New College Admission Test.
- After graduation, osteopaths serve one year of internship or residence before being licensed.
- People who wish to specialize must have two to five years of additional training.
- Ten of the fifteen osteopathic colleges participate in the American Association of Colleges of Osteopathic Medicine Application Service which allows people to make one application to all ten schools simultaneously.

EDUCATIONAL PROGRAM

370	Osteopathic Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, health, psychology, sociology, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 54.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.) p. 143.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College

21714	Nebraska Wesleyan University
22306	Northeast Community College
11934	Oklahoma College of Osteopathic Medicine and Surgery
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
11936	University of Osteopathic Medicine and Health Sciences
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

26109 ANESTHESIOLOGISTS

OCCUPATIONAL DESCRIPTION

Anesthesiologists administer anesthetics to render patients insensible to pain during surgical, obstetrical, and other medical procedures. DOT 070.101.010

HOLLAND CODE

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

1855	Medical Scientists
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants

WORK ACTIVITIES

- Examine patient to determine surgical risk and the type of anesthetic to administer.
- Discuss findings with medical practitioner concerned with the case.
- Position patient on operating table and administer anesthetic according to prescribed medical standards.
- Institute remedial measures to counteract adverse reaction or complications.
- Record type and amount of anesthetic administered and condition of patient before, during, and after anesthesia.

APTITUDES

- Be able to learn complex science, math, and the methods of practicing medicine and administering anesthetics.
- Have strong verbal and numerical abilities.
- Be able to plan and organize and direct others.
- Have good space and form perception, finger and hand dexterity, and ability to pay attention to details.
- Have scientific curiosity, emotional stability, and empathy.
- Be able to make decisions based on data, observations, and experience.
- Be able to relate to all kinds of people.

WORK SETTING

Environment
Work indoors.
Hours
Work 40 to 60 hours a week; may be on call for emergencies.
Employers
Hospitals, universities and medical centers, surgical clinics, health maintenance organizations, and government agencies.

CONSIDERATIONS

- Personal satisfaction may be provided by helping restore people's health.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Anesthesiologists are included in this group.

WAGES

Newly licensed physicians in Nebraska earn between $60,000 and $150,000 a year depending on specialty, geographic location, skill, and type of practice. Anesthesiologists are included in this group. Nationally, first year earnings for all physicians range between $20,000 and $90,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable

National
Favorable
Factors

- Growth in population, longer life spans, and increase in the number of surgeries may add to the need for these physicians.
- The extent to which other health specialists assume duties formerly done by anesthesiologists will influence growth.

PREPARATION

SKILLS

- Knowledge of physiology, microbiology, biochemistry, and general medicine.
- Knowledge of specialized aspects of anesthesiology.
- Skills in assessment of needs and risks.
- Knowledge of anesthetics, adverse reactions, and remedies.
- Skills in recordkeeping.
- Skills in relating to a variety of people.

LICENSING OR CERTIFICATION

- Anesthesiologists must be licensed by the Nebraska Board of Examiners in Medicine and Surgery.
- To be licensed, a person must graduate from an accredited college of medicine, have at least one year of graduate medical education, and pass an exam.

TRAINING

- Graduation from an accredited school of medicine is required.
- To be admitted to a medical school, a person must complete three to four years of premedicine subjects, have a high grade-point average, and pass a preadmission test called the New Medical College Admission Test.
- After medical school, these doctors must serve a three-to-five-year residency specializing in anesthesiology before being licensed to practice.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in biology, chemistry, physics, anatomy, health, health occupations, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 52.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 143.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2620 DENTISTS

OCCUPATIONAL DESCRIPTION

Dentists diagnose, prevent, and treat disease and injuries of the teeth, gums, and jaw. They take x-rays, fill cavities, straighten teeth, and treat gum diseases. They pull teeth and replace them with dentures. They also perform surgery on gums and supporting bones to correct them. Most practice general dentistry or the treatment of gums. A few dentists teach in dental schools, do research, or run dental health programs. DOT 072.101-010

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Endodontists (072.101.014)
Oral Surgeons (072.101-018)
Orthodontists (072.101-022)
Pedodontists (072.101-026)
Periodontists (072.101-030)
Prosthodontists (072.101-034)
Public-Health Dentists (072.101-038)
Military Dentists (M26200)

NCIS RELATED OCCUPATIONS

2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants
3630	Dental Hygienists
5232	Dental Assistants

WORK ACTIVITIES

- Examine teeth.
- Take and interpret x-rays.
- Treat gums.
- Take impressions for artificial teeth and dentures.
- Administer sedatives or anesthetics.
- Supervise assistants in mixing substances for tooth fillings, cleaning teeth, and keeping records.
- Use and operate many specialized instruments.
- Proper brushing and care of teeth.
- Advise patient on most suitable treatments.
- Perform surgery on mouth and jaw.
- Work in laboratories.

APTITUDES

- Have ability to learn the principles and procedures of dental medicine.
- Have good verbal ability to understand technical reading material, explain procedures to patients, and write reports.
- Have good space and form perception, finger dexterity and eye-hand coordination, and ability to use hands.
- Be able to make decisions based on data and observations.
- Be able to supervise assistants, relate to people, and handle a variety of activities.
- Have good numerical ability.

WORK SETTING

Environment
Work indoors in offices, treatment rooms, laboratories, and hospitals.

Hours
Work 40 to 50 hours a week; some work weekend and evening hours.

Employers
Self-employed in private practices, government agencies, clinics, U.S. Public Health Service, hospitals, and dental colleges.

CONSIDERATIONS

- Job carries prestige and may be satisfying.
- Establishing a practice is often costly, but earnings after the first two years of practice may be substantial.
- Some dentists begin practice by working for established dentists, serving in the armed

forces, or working in hospitals.
- May be exposed to communicable diseases and radiation.

NEBRASKA EMPLOYMENT

About 1,113 dentists are projected to be employed by 1991.

WAGES

During the first year, dentists tend to earn little more than minimum needed to cover expenses. However as their practice grows earnings usually rise rapidly. In Nebraska, newly licensed dentists earn between $25,000 and $110,000 a year depending on the type of practice, specialty, and geographic location. Specialists generally earn considerably more than general practitioners. Nationally, the average annual earnings for all newly licensed dentists span a range between $18,000 and $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors
- Population growth, concern for preventative dental medicine, and the growth of prepayment dental plans all contribute to the growing need for dentists.
- In Nebraska, few new dentists are needed for large cities, but small towns and rural areas still need dentists.

PREPARATION

SKILLS

- Knowledge of dental diagnostic and treatment procedures, human anatomy and physiology, and dental equipment and techniques.
- Skills in communication to explain dental care to patients.
- Skills in management and human relations.
- Skills in decision making.

LICENSING OR CERTIFICATION

- Dentists must be licensed by the Nebraska Board of Examiners in Dentistry.
- To be licensed, a person must be a graduate from an accredited college of dentistry, and pass the written exams.
- Thirty hours of continuing education are required biennially.

TRAINING

- Graduation from an accredited dental school is required which usually takes four years.
- To enter a dental school, a person must have two to four years of college study in predentistry, have a high grade-point average, and pass the Dental Admissions Test.
- After graduation, a Doctor of Dental Surgery (D.D.S.) or Doctor of Dental Medicine (D.M.D.) is awarded.
- To specialize or teach, a dentist must spend an additional two to four years in advanced dental training.

EDUCATIONAL PROGRAM

357	Dentistry
358	Dental Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, sociology, psychology, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 54-55.

Guide for Occupational Exploration (2nd ed., 1984), pp. 122-125.

Occupational Outlook Handbook (1990-91 ed.), p. 139.

Military Career Guide (1988-89 ed.), p. 277.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21311	Kearney State College
22304	Mid-Plains Community College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha

21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2701 VETERINARIANS

OCCUPATIONAL DESCRIPTION

Veterinarians diagnose, treat, and prevent disease and injury in animals. They operate on sick or injured animals and prescribe and give medicines, drugs, and vaccines. Some work only with small animals such as dogs and cats and treat them in hospitals or clinics. Some expand their practice to include large animals such as horses and cows and treat them on farms and ranches. They also help prevent the outbreak and spread of animal diseases. Some veterinarians do research, serve as government inspectors, or advise livestock owners. DOT 073.101-010

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Veterinary Anatomists (073.061-014)
Veterinary Bacteriologists (073.061-018)
Veterinary Epidemiologists (073.061-022)
Veterinary Pharmacologists (073.061-034)
Veterinary Virologists (073.061-042)
Poultry Veterinarians (073.101-014)
Zoo Veterinarians (073.101-018)
Veterinary Livestock Inspectors (073.161-010)
Veterinary Meat Inspectors (073.264-010)
Military Veterinarians (M27010)

NCIS RELATED OCCUPATIONS

1473	Inspectors and Compliance Officers
1853	Agricultural and Food Scientists
1854	Biological Scientists
23903	County-Agricultural Agents
2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2810	Optometrists
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants
5514	Livestock Farmers
5617	Livestock Workers
5624	Animal Caretakers

WORK ACTIVITIES

- Test animals and herds for diseases.
- Prescribe drugs, give injections, set broken bones, dress wounds, perform surgery, and administer other forms of treatment to animals.
- Perform autopsies and determine cause of death.
- Give advice on care and breeding of animals.
- May consult, teach, do research, or conduct inspections for government agencies.
- May specialize in treatment of any individual species.
- May specialize in preventing or controlling animal diseases which can be passed to man.
- May write technical materials or produce commercial products.

APTITUDES

- Be able to learn the fundamentals and practices of veterinary medicine.
- Have high verbal ability to understand technical reading material, write reports, and advice clients in the care of animals.
- Have very good space and form perception, finger dexterity, and hand coordination.
- Be able to lift medium loads.
- Be able to make decisions based on data and observations, work with precise standards, and keep accurate records.
- Be able to relate to people.

WORK SETTING

Environment

Work indoors in clinics and laboratories and outdoors in fields or on farms; may travel long distances to reach patients and treat them outdoors in all kinds of weather.

Hours

Work 40 to 60 hours per week; schedule may be irregular and include longer hours if working alone.

Employers

Self-employed in private practices, large clinics, private industries, zoos, government agencies, colleges and universities, research laboratories, meat product industries, and large ranches.

CONSIDERATIONS

- Veterinary work offers personal rewards and satisfaction from contributing to animal health and scientific development.
- Private practice offers a great deal of variety.
- Veterinarians risk physical injury and exposure to animal disease.

NEBRASKA EMPLOYMENT

About 2,042 veterinarians are projected to be employed by 1991.

WAGES

Newly graduated veterinarians working in private practices of established veterinarians earn between $20,000 and $27,500 a year in Nebraska. Nationally, the average income for all newly licensed veterinarians ranges from $22,000 to $48,000 a year depending on location, type of practice and specialty. Veterinarians who specialize in toxicology, laboratory animal medicine and pathology will command salaries at the upper end of the scale.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors

- Manpower studies predict an oversupply of veterinarians in private practice by 1990.
- Opportunities may be better for those who specialize in food animal practice, toxicology, and pathology or have postgraduate training to work in industrial and educational settings.
- Some rural areas may have a shortage of veterinarians specializing in large livestock.

PREPARATION

SKILLS

- Knowledge of animal anatomy, physiology, pathology, and biochemistry.
- Knowledge of surgical and treatment techniques for animals.
- Skills in understanding, using, and explaining technical information.
- Skills in diagnosis.
- Skills in business management and personal communication.
- Skills in decision making and recordkeeping.

LICENSING OR CERTIFICATION

- Veterinarians must be licensed by the Nebraska Board of Examiners in Veterinary Medicine and Surgery.
- To be licensed, a person must be at least 21 years of age, be of good moral character, and be a graduate of an accredited veterinary school.
- Thirty two hours of continuing education are required biennially.

TRAINING

- Graduate from a four-year professional program in an accredited college of veterinary medicine.
- To qualify for an accredited college of veterinary medicine, a person must have two to four years of college training, a high grade-point average, and pass an admissions test.
- Preference is usually given to residents of the states in which the veterinary schools are located.
- After completing the program, students receive the Doctor of Veterinary Medicine(DVM) degree.
- Previous work experience as a veterinarian's assistant or participating in animal-oriented organizations such as 4-H may be helpful.

EDUCATIONAL PROGRAM

378	Veterinary Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, vocational agriculture, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 55.

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Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 147.
Military Career Guide (1988-89.), p. 282.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
11907	Iowa State University
11908	Kansas State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11922	University of Missouri-Columbia
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2810 OPTOMETRISTS

OCCUPATIONAL DESCRIPTION

Optometrists examine patients' eyes to determine their vision level and to detect disease and injury. They test eyes for proper depth and color perception and the ability to focus. When necessary, they prescribe lenses and treatment. If they find evidence of disease, they refer the patients to doctors who treat eyes. Most optometrists supply eyeglasses and fit and adjust contact lenses. Some specialize in work with the aged or children. Others are concerned with the visual safety of industrial workers. Some optometrists teach or do research. DOT 079.101-018

HOLLAND CODE

ISR (Investigative, Social, Realistic)

SPECIALTIES

Military Optometrists (M28100)

NCIS RELATED OCCUPATIONS

2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmalogists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2830	Podiatrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3040	Physician Assistants
3690	Health Technologists and Technicians
36905	Optometric Assistants
6864	Optical Good Workers

WORK ACTIVITIES

- Administer eye tests.
- Analyze information from tests and determine corrective procedures.
- Prescribe eyeglasses, contact lenses, vision aids, vision therapy, or other specialized service.
- Refer patients to other medical specialists.
- Supervise assistants and technicians.
- Fit eyeglasses and contact lenses

APTITUDES

- Be able to learn optometric science.
- Have verbal ability to read, write clearly, and speak to patients.
- Have numerical ability to measure vision and prepare prescriptions.
- Have good space and form perception and hand and finger dexterity.
- Be able to make decisions based on data, observations, and experience.
- Be able to work with a variety of people.

WORK SETTING

Environment

Work indoors in offices and treatment rooms.

Hours

Work 40 or more hours a week; some may work evening and weekend hours.

Employers

Self-employed in private practice, hospitals, clinics, government agencies, health maintenance organizations, large companies, research organizations, public schools, and colleges and universities.

CONSIDERATIONS

- Job carries prestige and may offer satisfaction in helping people correct vision problems.
- Optometrists usually are able to set their own schedules.
- Setting up a new practice and buying equipment may be expensive.

NEBRASKA EMPLOYMENT

About 382 optometrists are projected to be employed by 1991.

WAGES

In Nebraska, new optometry graduates in their first full year of practice averaged between $28,000 and $42,500 a year depending on the location and area of specialization. Optometrists who specialize in pediatric, geriatric or primary care optometry may expect first year earnings at the upper end of the scale. Nebraska salaries for newly licensed optometrists are somewhat lower than the national averages with a range of $30,000 to $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Favorable
Factors

- The job opportunities for optometrists will increase due to the aging population, increasing awareness of the importance of vision correction, and the growth of health insurance plans covering optometric services.

PREPARATION

SKILLS

- Knowledge of optics, anatomy, and other sciences.
- Knowledge of specialized optometric equipment and evaluation techniques.
- Skills in communication, decision making, and analysis.
- Skills in supervision and recordkeeping.

LICENSING OR CERTIFICATION

- Optometrists must be licensed by the Nebraska Bureau of Examining in Optometry.
- To be licensed, a person must be the graduate of an accredited school of optometry and pass an exam.
- Thirty-two hours of continuing education are required biennially.

TRAINING

- Graduation from an accredited college of optometry is required and usually takes four years.
- To enter optometry school, a person must have two to four years of pre-optometry training and a high grade-point average.
- Graduates receive the Doctor of Optometry (O.D.) degree.

EDUCATIONAL PROGRAM

369	Optometry
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 63.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 141.
Military Career Guide (1988-89 ed.), p. 278.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21603	Dana College
21507	Doane College
11904	Ferris State College
21509	Hastings College
11905	Illinois College of Optometry
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2830 PODIATRISTS

OCCUPATIONAL DESCRIPTION

Podiatrists diagnose and treat diseases and disorders of the human foot. To help in diagnosis, they take x-rays and perform blood and other tests. They perform surgery, fit corrective devices, and prescribe drugs, therapy, and proper shoes. They treat a variety of foot conditions, including corns, bunions, calluses, ingrown toenails, skin diseases, and deformed toes. Most provide all types of foot care, but some specialize in surgery, bone disorders, or foot problems of children or the aged. DOT 079.101-022

HOLLAND CODE

SIR (Social, Investigative, Realistic)

SPECIALTIES

Military Podiatrists (M28300)

NCIS RELATED OCCUPATIONS

2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2890	Chiropractors
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3033	Physical Therapists
3040	Physician Assistants
5233	Health Aides

WORK ACTIVITIES

- Interview patients, and record and arrange case histories.
- Examine patients feet.
- Arrange x-rays and laboratory tests.
- Interpret lab findings and arrive at diagnosis.
- Prescribe treatment including physical therapy, drugs, corrective appliances, special diets, or surgery.
- Refer patients to other physicians.
- Maintain medical records and supervise office and staff.

APTITUDES

- Be able to learn the principles and practices of podiatric medicine.
- Have good verbal and math ability.
- Be able to relate easily to people.
- Have good space and form perception, hand and finger dexterity, and vision.
- Be able to make decisions based on data and observations.

WORK SETTING

Environment

Work indoors in offices, hospitals, examination and treatment rooms, surgical areas, and laboratories.

Hours

Work 40 or more hours a week.

Employers

Hospitals, colleges and universities, government agencies, clinics, professional sports associations, and self-employed in private practice.

CONSIDERATIONS

- Podiatrists may specialize in such areas as surgery, orthopedics, sports podiatry, or care of the feet of children or elderly.
- The seven four-year colleges of podiatric medicine are located in California, Illinois, New York, Pennsylvania, and Ohio, Florida and Iowa.

NEBRASKA EMPLOYMENT

About 45 podiatrists are projected to be employed by 1991.

WAGES

Newly licensed podiatrists in Nebraska earn between $30,000 and $72,000 a year depending on specialty and type of practice. Nebraska salary figures are slightly higher than the national salary range of $28,000 to $70,000 a year for all new podiatrists. Individuals starting their own practice will have earnings at the lower end of the scale while podiatrists who are salaried with an established practice will earn substantially more.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors
- Podiatry is one of the least crowded of the health professions.
- The popularity of fast-moving sports such as tennis and jogging, the aging population, and the coverage of podiatric care by health insurance should mean continued job opportunities in this area.
- Best prospects are in small towns and suburban areas.

PREPARATION

SKILLS

- Knowledge of physiology, osteology, anatomy, pathology, and podiatric medicine.
- Knowledge of physical therapy, orthotics, podiatric surgery, and medical drugs.
- Skills in analysis and diagnosis.
- Skills in communication, recordkeeping, and decision making.

LICENSING OR CERTIFICATION

- Podiatrists must be licensed by the Nebraska Board of Examiners in Podiatry.
- To be licensed, a person must be a high school graduate, graduate from a school of podiatry, and pass an exam.
- Twenty-four hours of continuing education are required biennially.

TRAINING

- Podiatrists must graduate from an accredited four-year college of podiatric medicine.
- To be admitted to a college of podiatric medicine, a person must complete at least three years of college study, have a high grade-point average, and pass the Medical College Admissions Test.
- After graduating from podiatry school, a person receives the Doctor of Podiatric Medicine (D.P.M.) degree and usually continues on to a one - to three-year residency.
- To specialize, a podiatrist must get additional training and experience.

EDUCATIONAL PROGRAM

363	Medicine
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, psychology, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 63.
Guide for Occupational Exploration (2nd e., 1984), pp. 122-125.
Occupational Outlook Handbook (1990-91 ed.), p. 146.
Military Career Guide (1988-89 ed.), p. 280.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2890 CHIROPRACTORS

OCCUPATIONAL DESCRIPTION

Chiropractors diagnose and treat spinal and other health disorders. Their treatment emphasizes the function of the nervous system as it relates to health and disease. Methods of treatment vary; most manually adjust parts of the body, especially the spine, as primary therapy. They also use water, light, heat, ultrasound, nutritional, and electric therapy. They use physical examinations, laboratory studies, and x-rays to aid in their diagnosis. DOT 079.101-010

HOLLAND CODE

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmologists
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
3010	Pharmacists
3033	Physical Therapists
5233	Health Aides

WORK ACTIVITIES

- Interview and examine the patient using methods standard to all health professions.
- Arrange necessary x-rays and laboratory test.
- Analyze results and diagnose disorder.
- Prescribe treatment including methods such as chiropractic adjustment of structural faults, dietary advice, exercise therapy, or professional counsel.
- Refer patients to other health services.
- Maintain medical records and supervise office and staff.
- Chiropractic methods do not include prescription drugs or major surgery.

APTITUDES

- Be able to learn the basic medical sciences and chiropractic practices.
- Have ability with words and numbers.
- Be able to understand space and form relationships.
- Have good physical coordination and finger and hand dexterity and be able to do medium lifting.
- Be able to make judgments based on data, experience and observations and plan programs of therapy.
- Have a desire to help people.

WORK SETTING

Environment

Work indoors in offices, examination rooms, and laboratories.

Hours

Work 40 or more hours a week; may work evening or weekend hours; generally set their own work schedule.

Employers

Self-employed in private practice, clinics, and industries.

CONSIDERATIONS

- Job may carry prestige.
- Buying equipment and setting up a new practice may be costly, but earnings after a few years of practice may be substantial.

NEBRASKA EMPLOYMENT

About 2,642 physicians are projected to be employed by 1991. Chiropractors are a part of this group.

WAGES

First year earnings for newly licensed chiropractors vary widely depending on geographic location and type of practice. Earnings for chiropractors starting their own practice may be as low as $12,000 a year. Chiropractors who work for well established practitioners in the Omaha-Lincoln metropolitan area may have earnings approaching $60,000 for the first year. Nationally, the first year salary range for all chiropractors is comparable to Nebraska with a range of $15,000 to $60,000 a year.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Favorable
Factors

- Public acceptance of chiropractors is growing.
- Many health insurance companies and federal health insurance programs pay for treatment which increases the demand for these workers.
- The number of chiropractic graduates is growing; so new graduates may face growing competition.
- Best opportunities may be in small towns and rural areas.

PREPARATION

SKILLS

- Knowledge of chiropractic diagnosis and treatment techniques and human anatomy and physiology.
- Skill in using specialized equipment.
- Skills in diagnosis and therapy.
- Skills in communication.
- Skills in decision making, recordkeeping, and supervision.

LICENSING OR CERTIFICATION

- Chiropractors must be licensed by the Nebraska Board of Examiners in Chiropractic.
- To be licensed, a person must be a graduate of an accredited chiropractic college and pass the exams.
- Continuing education requirements must be met.

TRAINING

- Chiropractors are required to complete at least two years of prechiropractic study plus graduate from an accredited four-year chiropractic college.
- The degree of Doctor of Chiropractic (D.C.) is awarded to graduates of the program.

EDUCATIONAL PROGRAM

373	Chiropractic
524	Chemistry
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, biology, chemistry, physics, anatomy, health, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 63.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 138.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11901	Cleveland Chiropractic College of Kansas City
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
11909	Logan College of Chiropractic
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
11913	Palmer College of Chiropractic
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

2901 REGISTERED NURSES

OCCUPATIONAL DESCRIPTION

Registered nurses perform a wide variety of health care functions. They observe and record symptoms, reactions, and the progress of patients. They give medications to patients as prescribed by doctors. They also help treat patients and instruct them and their families in proper health care. Some nurses provide nursing services in hospitals, doctors' offices, and nursing homes. Others do research work or instruct students.

HOLLAND CODE

SIE (Social, Investigative, Enterprising)

SPECIALTIES

School Nurses (075.124-010)
Community Health Staff Nurses (075.124-014)
Head Nurses (075.127-018)
Nurse Practitioners (075.264-010) (29011)
Nurse-Midwives (075.264-014)
Nurse Anesthetists (075.371-010) (29012)
General Duty Nurses (075.374-010)
Office Nurses (075.374-014)
Private Duty Nurses (075.374-018)
Occupational Health Nursing Staff Nurses (075.374-022)
Military Registered Nurses (M29010)

NCIS RELATED OCCUPATIONS

1310	Medicine and Health Managers
2610	Physicians
3010	Pharmacists
3031	Respiratory Therapists
3032	Occupational Therapists
3040	Physician Assistants
3660	Licensed Practical Nurses
3690	Health Technologists and Technicians
36906	Emergency Medical Technicians
36907	Surgical Technicians
52333	Medical Assistants

WORK ACTIVITIES

- Assess and record symptoms, reactions, and progress of patients.
- Administer medications and treatments as ordered by doctors.
- Educate patients and family members concerning treatment and proper health habits.
- Provide bedside nursing care.
- May supervise other staff.
- May perform routine lab and office work.
- May assess patients' needs and develop individual care plans.
- May use special equipment.

APTITUDES

- Be able to learn advanced sciences necessary for nursing.
- Have good finger and hand dexterity and overall physical coordination and be able to do moderate lifting.
- Be able to work with a variety of people.
- Have numerical and verbal abilities.
- Be able to make decisions based on data and observations and work within set standards.
- Be able to function under pressure and handle emergencies calmly.

WORK SETTING

Environment

Work indoors in offices, hospitals, patients' homes, treatment and examination rooms, birthing centers, and operating rooms.

Hours

Work 40 or more hours a week; shift may include weekend, evening, and night hours and may be rotated.

Employers

School districts, hospitals, government agencies, nursing homes, rehabilitation centers, residential centers, nursing homes, outpatient clinics, private doctors' offices, community health agencies, industrial plants, mental health centers, prisons, crisis intervention centers, armed services, voluntary health agencies, health maintenance organizations, dental offices, birthing centers, camps, and industries and businesses.

CONSIDERATIONS

- Job may offer personal satisfaction from helping people.
- Nurses often work as a member of a team.

NEBRASKA EMPLOYMENT

About 12,250 registered nurses are projected to be employed by 1991.

WAGES

Entry level salaries for registered nurses who possess a state license and who have less than two years professional experience range between $18,900 and $27,500 a year in Nebraska. Nationally, entry level salaries are somewhat higher than Nebraska with a range of $22,416 to $32,160 a year depending on geographic location, specialized training and experience.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Favorable
Factors

- Demand is expected to grow in nursing homes and home health agencies.
- Most nursing graduates will probably find nursing jobs, but those with bachelors or masters degrees and specialized training will have the best opportunities.
- In Nebraska, there is a greater need for nurses in smaller towns and rural areas.

PREPARATION

SKILLS

- Knowledge of medical concepts and terms, basic sciences, and nursing techniques.
- Knowledge of various treatments, medications, and medical equipment.
- Skills in observing and accurately recording a patient's progress.
- Skills in communication to work with patients, families, and other staff.
- Skills in organization, assessment, and counseling.

LICENSING OR CERTIFICATION

- Registered nurses are licensed by the Nebraska Board of Nursing.
- To be licensed, a person must be a high school graduate, of good moral character, complete the basic professional curriculum in an accredited school of nursing, and pass an exam.
- Continuing education requirements must be met.

TRAINING

- Three types of educational programs for nursing are available; a two-year associate degree program, a three-year diploma program at hospitals and independent schools, and a four-or five-year bachelor's degree program at colleges and universities.

EDUCATIONAL PROGRAM

353 Nursing

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, anatomy, sociology, psychology, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 56-58.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 160.
Military Career Guide (1988-89 ed.), p. 291.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21311	Kearney State College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center

21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

29011 NURSE PRACTITIONERS

OCCUPATIONAL DESCRIPTION

Nurse practitioners are registered nurses with additional knowledge and skills that enable them to work independently in evaluating patient needs and providing health care. They identify the state of health of a patient, screen for problems that need to be referred to physicians or other resources, and deal with acute and chronic problems. They coordinate all phases of the patient's care. Nurse practitioners often specialize in such areas as pediatrics, family planning, geriatrics, and obstetrics. DOT 075.264-010 (29011)

HOLLAND CODE

ISA (Investigative, Social, Artistic)

NCIS RELATED OCCUPATIONS

1310	Medicine and Health Managers
2610	Physicians
2901	Registered Nurses
29012	Nurse Anesthetists
3031	Respiratory Therapists
3040	Physician Assistants
3660	Licensed Practical Nurses
52333	Medical Assistants
5236	Nursing Aides, Orderlies, and Attendants

WORK ACTIVITIES

- Examine patients and take health histories.
- Order, interpret, and evaluate diagnostic tests.
- Recommend treatments, medication, or counseling.
- Maintain medical records.
- Establish treatment plans.
- Review case with physicians and other health care professionals.
- Have independent practice where state law permits.

APTITUDES

- Be able to learn biological sciences and practices of nursing.
- Have good math and verbal abilities in reading, writing and speaking.
- Have good space and form perception, general coordination, and hand and finger dexterity.
- Be able to handle a variety of activities,make decisions based on data and observations
- Be creative, flexible, able to work under stress, and willing to make decisions.

WORK SETTING

Environment

Work indoors in offices, clinics, examination and treatment rooms, hospitals, and patients' homes.

Hours

Work 40 or more hours a week; may be on call at all hours.

Employers

Hospitals, outpatient clinics, private doctors' offices, community health organizations, health centers, industrial plants, schools, mental health centers, prisons, crisis intervention centers, psychiatric hospitals, nursing homes, government agencies, armed services, and health maintenance organizations.

CONSIDERATIONS

- Nurse practitioners may receive personal satisfaction from being involved in disease prevention, patient education, and health maintenance.
- These nurses often work as members of a team.
- Job may require travel to patients' homes or clinics.

NEBRASKA EMPLOYMENT

About 12,250 registered nurses are projected to be employed by 1991. Nurse Practitioners are a part of this group.

WAGES

Entry level salaries for licensed nurse practitioners range from $16,100 to $27,000 a year in Nebraska. Nationally, starting salaries tend to be somewhat higher with a range of $17,000 to $35,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Favorable

Factors

- Growth in population, longer life spans, and the possibility of health insurance coverage for this type of health care may increase the need for these nurses.
- Increased emphasis on preventive health care should add to the job opportunities.

PREPARATION

SKILLS

- Knowledge of biological sciences and a wide range of nursing practices, methods, and techniques.
- Knowledge of medical drugs and their use, nutrition and its application to medicine, and medical lab testing and its interpretation.
- Skills in assessment, organization, analysis, diagnosis, and counseling.
- Skills in communication for reading, speaking, and writing.
- Skills in all aspects of nursing care and patient education.

LICENSING OR CERTIFICATION

- Nurse practitioners must be licensed by the Nebraska Bureau of Examining Boards.
- To be licensed, an applicant must graduate from an approved nurse practitioner program, pass a national certifying exam, and have an agreement with a cooperating physician.
- Nurse practitioners must be licensed registered nurses.

TRAINING

- Nurse practitioners must first complete a training program in nursing and become licensed as a registered nurse.
- After gaining several years of work experience in nursing, registered nurses may enter a training program to become practitioners.
- Training programs offered by hospitals may be nine to eighteen months in length while programs offered by colleges, universities, or medical schools are usually bachelor's or master's degree programs.

EDUCATIONAL PROGRAM

353 Nursing

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, sociology, psychology, anatomy, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 56-58.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 160.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21311	Kearney State College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

29012 NURSE ANESTHETISTS

OCCUPATIONAL DESCRIPTION

Nurse anesthetists are registered nurses who have completed additional specialized education and training in administering anesthetics to patients under the supervision of physicians, anesthesiologists, and dentists. They give anesthetics to patients so they will not feel pain during medical or dental operations. DOT 075.371-010 (29012)

HOLLAND CODE

ISE (Investigative, Social, Enterprising)

NCIS RELATED OCCUPATIONS

2610	Physicians
29011	Nurse Practitioners
3031	Respiratory Therapists
3040	Physician Assistants
3660	Licensed Practical Nurses
5236	Nursing Aides, Orderlies, and Attendants

WORK ACTIVITIES

- Consult with patient's physician concerning anesthetic.
- Check condition of patient, review medical history, and talk with patient.
- Obtain anesthetic and make sure equipment is ready.
- Follow instructions of attending physician.
- Administer anesthetic and monitor patient's vital signs.
- Monitor patients recovering from anesthetics.
- May treat patients requiring respiratory therapy.
- Maintain medical records, order supplies, and keep inventories.

APTITUDES

- Be able to learn advanced sciences necessary to nursing.
- Have numerical abilities.
- Have verbal abilities for speaking, reading, and writing.
- Be able to work with people, make decisions based on data, observations, and experience, and work under stress.
- Have good space and form perception and hand and finger dexterity and be able to do moderate lifting.
- Be able to make accurate observations, keep records, and work within precise standards.

WORK SETTING

Environment

Work indoors in operating rooms, treatment rooms, or other hospital areas.

Hours

Work 40 hours a week usually; may be on call 24 hours a day.

Employers

Hospitals, clinics, health maintenance organizations, medical group practices, and dental offices.

CONSIDERATIONS

- Schedule may be a regular day-schedule, but workers are on call much of the time.
- There may be unpleasant odors or fumes in the work area.

NEBRASKA EMPLOYMENT

About 12,250 registered nurses are projected to be employed by 1991. Nurse Anesthetists are included in this group.

WAGES

Entry level salaries for certified nurse anesthetists range between $16,100 and $26,000 a year. Nebraska salaries tend to be somewhat lower than the national average of $18,000 to $32,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Favorable

Factors

- The demand for nurse anesthetists will continue to grow as the number of people covered by health insurance grows, greater emphasis is placed on quality health care, and the average age of the population increases.
- As the demand is growing, the current supply of nurse anesthetists is limited.

PREPARATION

SKILLS

- Knowledge of human anatomy, physiology, medical terminology, nursing techniques, and various medications and anesthetics.
- Skills in communication and counseling.
- Skills in analysis, interpretation, and diagnosis.
- Skills in recordkeeping and decision making.

LICENSING OR CERTIFICATION

- Nurse anesthetists must be certified by the Nebraska Bureau of Examining Boards.
- To be licensed, applicants must graduate from an approved program of nurse anesthesia, pass a national certifying exam, and have an agreement with a cooperating physician.

TRAINING

- Nurse anesthetists must first complete a training program in nursing and become a licensed registered nurse.
- Next, a person must attend an accredited school of anesthesia for two years of additional training.

EDUCATIONAL PROGRAM

353 Nursing

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, anatomy, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 56-58.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 160.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21311	Kearney State College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3010 PHARMACISTS

OCCUPATIONAL DESCRIPTION

Pharmacists dispense drugs and medicine prescribed by medical and dental practitioners. They also advise people on the use of medicines including those that can be bought without a doctor's order. They may prepare medicines and test drugs for purity and strength. They keep records of the drugs patients use and advise doctors on the selection and use of drugs. Many who work in drug stores also buy and sell goods and hire and supervise staff. Others teach, do research and consulting, or write technical articles. DOT 074.161-010

HOLLAND CODE

IES (Investigative, Enterprising, Social)

SPECIALTIES

Radiopharmacists (074.161-014)
Military Pharmacists (M30100)

NCIS RELATED OCCUPATIONS

1845	Chemists
1855	Medical Scientists
2610	Physicians
2620	Dentists
2701	Veterinarians
2901	Registered Nurses
3040	Physician Assistants
3831	Chemical Technologists and Technicians
52334	Pharmacy Helpers

WORK ACTIVITIES

- Prepare and dispense drugs and medications.
- Give drug-related information and advise to health professionals and patients.
- Keep records of purchase and distribution of drugs.
- Maintain patient records.
- Order and store vaccines, serums, and other drugs.
- Monitor drug therapy of patients.
- May supervise employees, order and display other merchandise, and direct business activities of a pharmacy or drug store.
- May provide educational programs for their health personnel.
- May act as a consultant or do research or teach.

APTITUDES

- Be able to learn chemical properties and compounding of drugs.
- Have high numerical ability and verbal ability to read technical materials and advise others.
- Be able to understand space and form relationships, make decisions based on data, and measure accurately within precise standards.
- Be able to work quickly and accurately under pressure.
- Have good recordkeeping ability, finger dexterity, and sense of color.

WORK SETTING

Environment
Work indoors in pharmacies, hospitals, and labs.

Hours
Work 40 to 50 hours a week, depending on employer; some evening and weekend hours may be required.

Employers
Retail pharmacies, pharmacy departments in large retail stores, hospitals, research labs, pharmaceutical manufacturers, government agencies, local health agencies, colleges and universities, and self-employed.

CONSIDERATIONS

- Job may be satisfying.
- Worker faces much responsibility for the health of patients, and mistakes could result in serious problems.

NEBRASKA EMPLOYMENT

About 1,272 pharmacists are projected to be employed by 1991.

WAGES

Salaries for pharmacists vary according to the size, location and type of employer as well as the educational and professional attributes of the worker. In Nebraska, starting salaries range between $28,267 and $41,329. Nationally, starting salaries tend to be somewhat lower with a range of between $25,000 and $35,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- The growth and aging of the population may create some jobs.
- Opportunities for part-time work are generally good.
- If the number of graduates continues at its present rate of increase, competition will be strong.
- People with advanced degrees have the best opportunities.
- In Nebraska, more opportunities exist in small towns or rural areas.

PREPARATION

SKILLS

- Knowledge of human physiology, biochemistry, and drugs and their application to therapy in various settings.
- Knowledge of regulations and standards concerning strength and purity of drug and methods of reading and filling written prescriptions.
- Skills in interpreting and understanding written directions.
- Skills in written and verbal communication.
- Skills in checking accuracy and seeing details.

LICENSING OR CERTIFICATION

- Pharmacists must be licensed by the Nebraska Board of Examiners in Pharmacy.
- To be licensed, a person must be 21 years of age, be a graduate of an accredited school of pharmacy, have completed an internship in a hospital or community pharmacy, pass and exam.
- Continuing education requirements must be met.

TRAINING

- Pharmacists must complete at least five years of college study leading to a bachelors degree in pharmacy.
- Many accredited colleges of pharmacy require that a person pass the Pharmacy College Admission Test (PCAT) or the College Entrance Examination Board (CEEB) to be admitted.

EDUCATIONAL PROGRAM

372 Pharmacy

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, biology, chemistry, anatomy, health, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 56.
Guide for Occupational Exploration (2nd ed., 1984), pp. 127-131.
Occupational Outlook Handbook (1990-91 ed.), p. 153.
Military Career Guide (1988-89 ed.), p. 288.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus

3020 DIETITIANS

OCCUPATIONAL DESCRIPTION

Dietitians guide people in their eating habits to help them stay healthy or recover from ailments. They supervise the production of food, plan menus and diets for theraputic treatment, and manage personnel and food purchases. Others teach, do research, or act as consultants.

HOLLAND CODE

SIE (Social, Investigative, Enterprising)

SPECIALTIES

Research Dietitians (077.061-010)
Chief Dietitians (077.117-010)
Dietetic Technicians (077.121-010)
Community Dietitians (077.127-010)
Clinical Dietitians (077.127-014)
Consultant Dietitians (077.127-018)
Teaching Dietitians (077.127-022)
Dietetic Interns (077.167-010)
Military Dietitians (M30200)

NCIS RELATED OCCUPATIONS

1351	Food Service and Lodging Managers
13512	Food Service Managers
18533	Food Technologists
23901	County Home-Demonstration Agents
23902	Home Economists
5214	Cooks

WORK ACTIVITIES

- Assess the nutritional needs of patients and prepare individual dietary plans.
- Consult with physicians and instruct patients.
- Teach groups; visit homes.
- Direct food service systems.
- Hire, train, and direct food service workers.
- Write reports, order food and equipment, and prepare menus and work schedules.
- Supervise preparation of food.
- Some teach, conduct research, or prepare articles for publication.

APTITUDES

- Be able to learn the basics of nutritional science and dietetics.
- Have verbal abilities for reading, writing, and communicating.
- Be able to keep records, visualize space and form relations, and work with scientific data.
- Have planning and organizing abilities, resourcefulness, and ability to work under pressure.
- Be able to supervise and train others.
- Be able to get along with a variety of people.

WORK SETTING

Environment

Work indoors in offices, food production and service areas, kitchens, patients' rooms, laboratories, and classrooms.

Hours

Work 40 hours a week; schedule may include weekend and holiday hours.

Employers

Hospitals, nursing homes, schools, clinics, community health agencies, government agencies, food service companies, child-care centers, research laboratories, colleges and universities, health clubs, weight reduction and wellness programs, and self-employed.

CONSIDERATIONS

- Dietitians may find personal satisfaction in educating people to improve their health.
- Many positions are part-time.
- Workers may travel a great deal, but they also may have flexibility in their work schedule.

NEBRASKA EMPLOYMENT

About 333 dietitians and nutritionists are projected to be employed by 1991.

WAGES

Entry level salaries for registered dietitians with a bachelors degree range between $15,200 and $21,800 a year in Nebraska. National salaries tend to be slightly higher with an entry level range of $18,000 to $25,000 a year.

EMPLOYMENT OUTLOOK

Nebraska

Favorable

National

Favorable

Factors

- Demand will increase as a result of continued interest in physical fitness and diet to maintain health and expanded health insurance programs that cover dietitians' services.
- In Nebraska, there will be less competition outside the larger cities.

PREPARATION

SKILLS

- Knowledge of principles of nutrition and foods, quantity cooking, physiology, biochemistry, and financial and personnel management.
- Skills in communication for giving speeches, writing reports, and relating to patients and other medical personnel.
- Skills in teaching and program planning.
- Skills in decision making.

LICENSING OR CERTIFICATION

- To qualify for professional recognition, dietitians must register with the American Dietetic Association.
- To qualify as a Registered Dietitian (R.D.), a person must have a bachelors degree from an institution approved by the American Dietetic Association, complete an internship or have three years of full-time experience, and pass an exam.
- Continuing education requirements must be met.

TRAINING

- For dietitians, the minimum educational requirement is a bachelors degree followed by a six- to twelve-month clinical internship.
- For dietetic technicians, the minimum educational requirement is usually two years of training.
- Previous work experience in food service or food production may be helpful.
- Training in business administration and computer programming may also be helpful.
- Training in some of the speciality occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

391	Home Economics
393	Dietetics
399	Food Management
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, health, home economics education, foods, accounting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 60-61.

Guide for Occupational Exploration (2nd ed., 1984), pp. 188-218.

Occupational Outlook Handbook (1990-91 ed.), p. 150.

Military Career Guide (1988-89 ed.), p. 285.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
11904	Ferris State College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22306	Northeast Community College
21715	Peru State College
11915	Rocky Mountain School of Meatcutting
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22517	York College

3031 RESPIRATORY THERAPISTS

OCCUPATIONAL DESCRIPTION

Respiratory therapists operate equipment to treat patients who have breathing problems. They operate equipment such as ventilators, mist tents, and diagnostic equipment. They administer drugs and oxygen and observe and respond to changes in the condition of the patients. The treatment may range from giving short-term relief to asthma patients to giving emergency care in cases of heart failure, stroke, drowning, or shock, to the long-term care of patients with chronic respiratory conditions. DOT 079.361-010

HOLLAND CODE

SIR (Social, Investigative, Realistic)

SPECIALTIES

Military Respiratory Therapists (M30310)

NCIS RELATED OCCUPATIONS

2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3032	Occupational Therapists
3033	Physical Therapists
3034	Speech Pathologists and Audiologists
3040	Physician Assistants
3660	Licensed Practical Nurses
3690	Health Technologists and Technicians
36901	Electrocardiograph Technicians
36906	Emergency Medical Technicians

WORK ACTIVITIES

- Work under direction of physician.
- Help diagnose respiratory problems.
- Treat patients to aid their breathing and cardiopulmonary deficiencies.
- Set up, run, and monitor special equipment.
- Instruct patients in use of treatment methods and breathing aids.
- Test and monitor progress of patients.
- May supervise respiratory therapy technicians.

APTITUDES

- Have ability to learn principles and techniques of respiratory therapy.
- Have good manual and finger dexterity and general coordination.
- Be able to work with a variety of people.
- Be able to carry out a variety of tasks, work according to set standards, and make decisions based on data.
- Have good space and form perception.
- Have good numerical ability and verbal ability to understand spoken and written orders and give directions.

WORK SETTING

Environment

Work indoors in health care facilities and ambulances.

Hours

Work 40 hours a week; shifts may be rotating and include, evening, weekend, and holiday hours.

Employers

Hospitals, clinics, nursing homes, ambulance services, oxygen equipment rental companies, home health agencies, colleges and universities, and private individuals.

CONSIDERATIONS

- Job may offer personal satisfaction in helping others.
- Work may be stressful; any mistakes in judgment may result in a loss of life.
- Job may involve stooping, walking, reaching, contact with fumes, and standing for long periods of time.

NEBRASKA EMPLOYMENT

About 432 respiratory therapists are projected to be employed by 1991.

WAGES

Starting salaries for respiratory therapists employed in hospitals in Nebraska range between $18,500 and $27,000 a year. Nationally, salaries span a range of between $15,000 and $25,000 a year. Starting salaries vary according to the size and location of the hospital as well as the college records and experience of the therapist and the level of responsibility of the position.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Growth may occur because of technological advances in diagnosis and treatment of respiratory diseases, an increasing incidence of cardiopulmonary diseases, and the increasing number of people over 65.

PREPARATION

SKILLS

- Knowledge of respiratory therapy techniques and the use of specialized medical equipment and instruments.
- Skills in working with people under physical stress.
- Skills in recordkeeping and decision making.

LICENSING OR CERTIFICATION

- Respiratory therapists must be licensed by the Nebraska Board of Examiners in Respiratory care.
- To be licensed a person must be 21 years of age, be a high school graduate or the equivalent, complete an accredited respiratory care program, and pass a written examination.
- To become a Registered Respiratory Therapist (R.R.T.) a person must be a Certified Respiratory Therapy Technician (C.R.R.T.) be a graduate of an accredited two- or four-year program, have at least 62 semester hours of accredited college courses, and pass written and clinical simulation exams given by the National Board for Respiratory Care.

TRAINING

- Educational training programs may range in length from eighteen months to four years.
- A bachelors degree is awarded to those completing four years of training; those studying for lesser time periods earn associate degrees.

EDUCATIONAL PROGRAM

367 Rehabilitation Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, physics, algebra, health, psychology, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 64.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 163.
Military Career Guide (1988-89 ed.), p. 75.

SCHOOLS

21102	Chadron State College
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11903	Emporia State University
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
22205	Western Nebraska Community College-Scottsbluff Campus

3032 OCCUPATIONAL THERAPISTS

OCCUPATIONAL DESCRIPTION

Occupational therapists develop and use treatment programs to help people with physical, mental, and emotional disabilities learn to perform the tasks of daily living. The disability of limitation may arise from physical injuries, diseases, learning problems, emotional disturbances, or the aging process. Occupational therapists evaluate patients' abilities and skills. They set goals and plan programs together with the patient and other members of the medical staff. Occupational therapists may help patients regain physical strength or relearn daily routines such as dressing and cooking. They may design and make special equipment and splints for the disabled. They also may plan and direct theraputic activities. DOT 076.121-010

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

SPECIALTIES

Industrial Therapists (076.167-010)
Military Occupational Therapists (M30320)

NCIS RELATED OCCUPATIONS

20324	Case Aides
2033	Recreation Workers
24013	Vocational-Rehabilitation Counselors
2901	Registered Nurses
3031	Respiratory Therapists
3033	Physical Therapists
3034	Speech Pathologists and Audiologists
3040	Physician Assistants
52332	Occupational Therapy Assistants

WORK ACTIVITIES

- Collect information concerning patients' ailments and limitations.
- Design programs to help patients to return to work, adjust to disabilities, or develop physical abilities.
- Teach living, vocational, or craft skills.
- May plan educational, recreational, and social activities for large groups of patients.
- May design or fit adaptive devices such as braces.
- Consult with other medical personnel.
- Observe progress of patient and maintain medical records.

APTITUDES

- Be able to learn the techniques of occupational therapy.
- Have verbal abilities to read, write, and speak.
- Have good space and form perception and hand and finger dexterity.
- Be able to make decisions and evaluations and solve problems.
- Have an objective view of illnesses and disabilities.
- Be able to motivate people.
- Have patience and a desire to help others.
- Be creative and self-confident.

WORK SETTING

Environment
Work indoors in offices or activity rooms and sometimes in homes of clients.

Hours
Work 40 hours a week; some work part time; some evening hours may be required.

Employers
Hospitals, nursing homes, rehabilitation centers, public agencies, schools, outpatient clinics, research centers, home health agencies, psychiatric facilities, and self-employed.

CONSIDERATIONS

- Job may be both frustrating and rewarding.
- Travel to patients' homes may be required.
- Occupational therapists usually work as a part of a health team.

NEBRASKA EMPLOYMENT

About 160 occupational therapists are projected to be employed by 1991.

WAGES

Entry level salaries for licensed occupational therapists employed in hospitals average about $22,500 a year nationally. Starting salaries for therapists employed by the Federal Government average about $18,500 a year. In Nebraska, entry salaries range between $16,161 and $23,420 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- The number of people who need rehabilitative services will rise through 1995.
- Demand for occupational therapists will be affected in the future by changes in the way health care is delivered and paid for.
- Enrollments in occupational therapy programs have leveled in recent years.

PREPARATION

SKILLS

- Knowledge of anatomy, neuroanatomy, kinesiology, diseases, disabilities and activity analysis.
- Skills in using equipment and materials used in occupational therapy.
- Skills in written and spoken communication.
- Skills in planning and developing programs that meet needs.
- Skills in decision making, observation, and recordkeeping.

LICENSING OR CERTIFICATION

- Occupational therapists must be licensed by the Nebraska Board of Examiners of Occupational Therapy Practice.
- To be licensed, applicants must complete an accredited program in occupational therapy plus six months supervised field work at an educational institution and pass an exam or have practiced as an occupational therapist, or occupational therapy assistant for at least one of the previous five years and be certified as a registered occupational therapist or assistant.

TRAINING

- Training can be a four-year bachelors degree program or a two-year program that is entered after two years of college.
- Masters degree programs are available for those with a bachelors degree in another field.

EDUCATIONAL PROGRAM

367 Rehabilitation Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, sociology, psychology, health, and arts and crafts.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 59.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 152.
Military Career Guide (1988-89 ed.), p. 287.

SCHOOLS

21102	Chadron State College
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11903	Emporia State University
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
222	Western Nebraska Community College-Scottsbluff Campus

3033 PHYSICAL THERAPISTS

OCCUPATIONAL DESCRIPTION

Physical therapists help people overcome or adjust to physical disabilities caused by injury, illness, or birth defects. Their patients include accident victims, handi-capped children, and disabled older people. They test and measure patients' physical abilities and plan treatment programs to help them. They may use such means as exercise, massage, water, or electricity to relieve pain or improve the condition of muscle and skin. Some teach, do research, or supervise clinical students. Other specialize in pediatrics, geriatrics, acute care, or rehabilitation. DOT 076.121-014

HOLLAND CODE

SIR (Social, Investigative, Realistic)

SPECIALTIES

Manual-Arts Therapists (076.124-010)
Corrective Therapists (076.361-010)
Military Physical Therapists (M30330)

NCIS RELATED OCCUPATIONS

2830	Podiatrists
2890	Chiropractors
3031	Respiratory Therapists
3032	Occupational Therapists
3034	Speech Pathologists and Audiologists
3040	Physician Assistants
3401	Athletes and Related Workers
34011	Athletic Trainers
52331	Physical Therapy Assistants

WORK ACTIVITIES

- Administer and interpret tests to determine muscular strength, motor development, functional capacity, or respiratory and circulatory efficiency.
- Plan and carry out appropriate therapeutic procedures.
- Evaluate and record patient's progress.
- Consult with other medical staff.
- Instruct patients and families on proper techniques, importance of treatment, and use of special devices.

APTITUDES

- Be able to learn complex techniques of physical therapy.
- Have good verbal ability to talk with patients, read technical materials, and write reports.
- Have good space and form perception, hand and finger dexterity, and general coordination.
- Be able to relate to a variety of people and direct and influence others.
- Be able to make judgments based on data and observations and take responsibility for planning programs.
- Be emotionally stable, creative, patient, and understanding.

WORK SETTING

Environment
Work indoors in therapy and treatment rooms; may work in patients' homes.

Hours
Work 40 hours a week with occasional weekend and evening work; part-time positions common.

Employers
Rehabilitation centers, hospitals, clinics, nursing homes, public health agencies, schools, rehabilitation centers, private physicians, out patient and sports medicine clinics, and self-employed.

CONSIDERATIONS

- Work may be both frustrating and rewarding.
- Physical therapists may work as part of a medical team.
- There are limited training opportunities in the nation.

NEBRASKA EMPLOYMENT

About 419 physical therapists are projected to be employed by 1991.

WAGES

In Nebraska, salaries for physical therapists span a range of between $25,771 and $36,587 a year. The average annual salary for all physical therapists in Nebraska is $30,347. Nationally, entry level salaries range between $18,000 and

$29,500 a year. The average entry level salary for all physical therapists at the national level is $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Employment opportunities will grow because of the increasing average age of the population and because the use of phy-sical therapists can shorten the length of stay in hospitals.
- The limited training opportunities are not expected to match the demand for physical therapists.

PREPARATION

SKILLS

- Knowledge of principles, techniques, materials, and equipment used in physical therapy.
- Knowledge of sciences including human anatomy, kinesiology, and human physiology and human growth and development.
- Skills to adapt treatment to patients' needs.
- Skills in teaching and motivating patients.
- Skills in recordkeeping and report writing.
- Skills in evaluation, planning, and decision making.
- Skills in communication and listening.

LICENSING OR CERTIFICATION

- Physical therapists must be licensed by the Nebraska Board of Examiners in Physical Therapy.
- To be licensed, an applicant must be a high school graduate, graduate from an accredited school of physical therapy, and pass an exam.

TRAINING

- The minimum educational requirement is a four-year bachelors degree in physical therapy.
- A person with a bachelors degree in another field can earn a second bachelors degree or certification in physical therapy through a program of twelve to sixteen months.
- Some employers may require a masters degree.
- Previous volunteer work in physical therapy may help chances for getting into an accredited physical therapy training program.

EDUCATIONAL PROGRAM

367 Rehabilitation Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, physics, health, psychology, and physical education.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 59-60.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 155.
Military Career Guide (1988-89 ed.), p. 289.

SCHOOLS

21102	Chadron State College
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11903	Emporia State University
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
22205	Western Nebraska Community College-Scottsbluff Campus

3034 SPEECH PATHOLOGISTS AND AUDIOLOGISTS

OCCUPATIONAL DESCRIPTION

Speech pathologists and audiologists diagnose and treat speech and hearing disorders in adults and children. Speech pathologists determine speech and language skill levels using oral and written tests, observing the patient, and gathering information from physicians, teachers, and other professionals. Audiologists use sensitive electronic instruments and equipment to test hearing. Some do research, teach, or do consulting work. DOT 076.101-010

HOLLAND CODE

ISE (Investigative, Social, Enterprising)

SPECIALTIES

Speech Pathologists (076.107-010)
Military Speech Therapists (M30340)

NCIS RELATED OCCUPATIONS

2350	Special Education Teachers
24013	Vocational-Rehabilitation Counselors
3031	Respiratory Therapists
3032	Occupational Therapists
3033	Physical Therapists

WORK ACTIVITIES

- Administer a variety of tests to determine type, degree, and cause of impairment.
- Interpret test results and diagnose cause.
- Recommend type of aids or devices needed and rehabilitative measures to be taken.
- Conduct and supervise rehabilitation programs.
- Counsel clients, family members, employers, teachers, and other health professionals.
- Maintain medical records.
- Some teach, conduct research, or administer programs.
- May specialize in geriatrics, industrial audiology, pediatrics, or research design.

APTITUDES

- Be able to learn the principles and practices of audiology and speech pathology.
- Have high verbal abilities to read scientific literature, evaluate physical problems, and communicate with people.
- Be able to keep accurate records, direct projects, and make decisions based on data and observations.
- Be able to hear well and speak clearly.
- Have patience, emotional stability, and an interest in helping people.
- Have good space and form perception and hand and finger dexterity.

WORK SETTING

Environment

Work indoors in offices, classrooms, clinics, or laboratory settings.

Hours

Work 40 hours or more a week; those working in schools usually work nine months a year.

Employers

Self-employed in private practices, hospitals, educational institutions, clinics, rehabilitation centers, public health agencies, government agencies, and home health agencies.

CONSIDERATIONS

- Workers often receive satisfaction from seeing client's improvements.
- Job may require work with children and parents.
- Some may have to travel from school to school.

NEBRASKA EMPLOYMENT

About 483 audiologists and speech pathologists are projected to be employed by 1991.

WAGES

Entry level salaries for speech pathologists and audiologists with a masters degree range between $20,176 and $31,200 a year in Nebraska. Individuals working in hospitals, and medical centers, in major metropolitan areas will command the highest salaries. Nebraska salaries parallel entry level wages nationally.

EMPLOYMENT GROWTH

Nebraska

Favorable

National
Favorable
Factors

- Reductions in government spending on speech and hearing programs may limit new positions.
- Job opportunities may be better in private practices, hospitals, home health agencies, rehabilitation centers, and nursing homes than in schools.
- Competition for openings in large urban areas is expected to be strong.

PREPARATION

SKILLS

- Knowledge of processes and disorders of speech, hearing, and language.
- Skills in communication in oral and written forms.
- Knowledge of current treatment and training techniques and use of diagnostic equipment.
- Skills in planning, development, and organization.
- Knowledge of computer technology and its application to speech pathology and audiology.

LICENSING OR CERTIFICATION

- Most employers require certification by the American Speech, Language, and Hearing Association.
- To be certified by ASHA, a person must have a masters degree in audiology or speech pathology, complete a year of clinical work, and pass a national exam.
- Audiologists and speech pathologists in private practice in Nebraska must be licensed by the Nebraska Board of Examiners in Audiology and Speech-Language Pathology.
- To be licensed, applicants must have a masters degree, 300 hours of clinical experience, and pass an exam.
- Those who work in public schools must be certified by the Nebraska Department of Education.

TRAINING

- The minimum educational requirement is a bachelor's degree in audiology or speech pathology or in teacher education with courses in speech and hearing therapy.
- Most employers in private practice require a masters degree from an ASHA-approved program.

EDUCATIONAL PROGRAM

368 Audiology and Speech Pathology

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including composition, speech, biology, physics, health, psychology, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 58.
Guide for Occupational Exploration (2nd ed., 1984), pp. 122-126.
Occupational Outlook Handbook (1990-91 ed.), p. 165.
Military Career Guide (1988-89 ed.), p. 292.

SCHOOLS

21311	Kearney State College
22402	McCook Community College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln

3040 PHYSICIAN ASSISTANTS

OCCUPATIONAL DESCRIPTION

Physicians assistants provide medical services under the supervision of a physician. They obtain complete medical histories, perform appropriate physical examinations, order lab tests, and make judgments about the patient's condition or problem. They diagnose a wide range of medical problems, and in many cases prescribe treatment and/or medications. Complicated medical problems are referred to the physician. They are involved in such activities as first assisting in surgery, counseling patients on health and disease matters, suturing, applying and removing casts, and performing other technical procedures. They may specialize in such areas as sports medicine, surgery, pediatrics, gynecology, internal medicine and others. DOT 079.364-018

HOLLAND CODE

ISA (Investigative, Social, Artistic)

SPECIALTIES

Military Physician Assistants (M30400)

NCIS RELATED OCCUPATIONS

2610	Physicians
26101	Pathologists
26102	Gynecologists
26103	Internists
26104	Ophthalmology
26105	Pediatricians
26106	Surgeons I
26107	Psychiatrists
26108	Osteopaths
26109	Anesthesiologists
2620	Dentists
2701	Veterinarians
2810	Optometrists
2830	Podiatrists
2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3010	Pharmacists
3031	Respiratory Therapists
3032	Occupational Therapists
3033	Physical Therapists
3660	Licensed Practical Nurses
3690	Health Technologists and Technicians
36906	Emergency Medical Technicians
36907	Surgical Technicians
52333	Medical Assistants

WORK ACTIVITIES

- Obtain patients' medical histories.
- Give physical examinations.
- Order and interpret laboratory, x-ray, and other tests.
- Diagnose and treat common medical problems.
- Refer complicated problems to physicians.
- Initiate emergency treatment in life-threatening situations.
- Assist in surgery.
- Apply and remove casts.
- Counsel patients and families.

APTITUDES

- Be able to learn biological sciences and practices of physician assisting.
- Have good verbal abilities in reading, writing, and speaking.
- Have good math ability, space and form perception, and general coordination.
- Be able to relate to a variety of people and make decisions based on data and observations.

WORK SETTING

Environment

Work indoors in treatment and examination rooms, offices, laboratories, patients's rooms, surgical areas, or other hospital areas.

Hours

Work 40 to 60 hours a week; some evening, weekend, or holiday hours may be required.

Employers

Hospitals, clinics, nursing homes, rehabilitation centers, health maintenance organizations, private doctors' offices, correctional institutions, and government agencies.

CONSIDERATIONS

- Physician assistants may experience personal satisfaction from serving people's medical needs.
- These people work as members of a team.

- This job may be stressful and require quick, accurate responses in emergencies.

NEBRASKA EMPLOYMENT

About 226 physician assistants are projected to be employed by 1991.

WAGES

Starting salaries for licensed physicians assistants range between $25,000 and $35,000 a year in Nebraska. Nationally, entry level salaries compare favorably with Nebraska with a range of $20,000 to $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors
- An oversupply of physicians and the increased use of nurse practitioners could limit the demand for physician assistants.
- Population growth, longer life spans, and increased public concern for maintenance of health should increase the need for these workers.
- Opportunities are better in rural areas where physicians are less willing to settle.

PREPARATION

SKILLS

- Knowledge of biological sciences and basic medical practices and procedures.
- Skills in communication for writing and speaking.
- Skills in decision making and recordkeeping.

LICENSING OR CERTIFICATION

- Physician assistants must be licensed by the Nebraska Bureau of Examining Boards Physician's Assistant Committee.
- To be licensed, an applicant must be a graduate of a physician assistant program and pass a national certifying examination.

TRAINING

- There are two methods of training in this field: the university-based method and the MEDEX method.
- University-based programs usually take two years to complete and require that a person already have either two years of college study or a bachelors degree.
- The MEDEX programs last eighteen months and are designed for medical corpsmen, nurses, or other people who have had extensive, direct patient care experience.
- Previous work as a nurse's aid or orderly may be helpful.

EDUCATIONAL PROGRAM

366	Allied Health Services
375	Clinical Health Sciences
386	Respiratory Therapy Technician

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, physics, anatomy, sociology, psychology, health, and health occuaptions.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 65.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.
Occupational Outlook Handbook (1990-91 ed.), p. 157.
Military Career Guide (1988-89 ed.), p. 290.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21507	Doane College
21311	Kearney State College
11945	Lakewood Community College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center

3210 AUTHORS

OCCUPATIONAL DESCRIPTION

Authors write original material to entertain and inform people. They gather information and ideas and use this information to develop themes and write manuscripts which they submit for publication. Some write books, plays, novels, poems, or other related works. Others do such things as write words for songs, prepare scripts for radio and television announcers, or adapt books or plays into scripts for movies. Still others use their knowledge of language to translate spoken or written passages from one language to another or to sign language.

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Lyricists	(131.067-034)
Playwrights	(131.067-038)
Poets	(131.067-042)
Prose, Fiction, and Nonfiction Writers	(131.067-046)
Continuity Writers	(131.087-010)
Readers	(131.087-014)
Screen Writers	(131.087-018)

NCIS RELATED OCCUPATIONS

3312	Editors
3313	Reporters
3980	Technical Writers

WORK ACTIVITIES

- Pick subject matter based on personal interest or get assignment from publisher.
- Do research and develop information.
- Organize material and plan arrangement or outline.
- Develop theme, plot, order, characterization, and story line.
- Write draft of manuscript and review, revise, correct, and submit for publication.
- Talk with publishers, representative about manuscript changes.
- May specialize in one or more styles or types of writing such as essays, short stories, or novels.

APTITUDES

- Be able to learn principles and methods of writing.
- Have creativity, imagination, and curiosity.
- Be able to identify with others and their experiences.
- Be self-motivated and self-disciplined.
- Be able to interpret people's feelings, attitudes, and opinions through writing.

WORK SETTING

Environment
  Work indoors in classrooms, offices, and other work areas.

Hours
  Work 40 or more hours a week; some work may be part time.

Employers
  College and universities, book publishers, magazines, newspapers, businesses, advertising and public relations firms, and self-employed as free-lance writers.

CONSIDERATIONS

- Free-lance writers have a great deal of flexibility and independence in their work, but their earnings may be quite low.
- Job may be satisfying for people who enjoy being creative.
- People who work for a publishing firm or other businesses may be under pressure to meet publication deadlines.

NEBRASKA EMPLOYMENT

About 790 writers and editors are projected to be employed by 1991. Authors are a part of this group.

WAGES

Entry level salaries for writers and editors vary widely according to size, location and type of employer, level of responsibility, and demonstrated experience. In Nebraska, starting salaries range from $12,000 to $20,800 a year. Nebraska salaries are considerably lower than the national entry level range of $16,000 to $30,000 a year.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Favorable
Factors

- Strong competition can be expected in this field, but people who are gifted writers may find success if they have the patience to keep trying.
- Demand is greater for experienced, talented writers with specific technical knowledge or good background in area of assignment particularly in business, science, and health.
- Fiction writers may have more success if they contract with agents who are able to get a reading from editors.

PREPARATION

SKILLS

- Knowledge of grammar, composition, punctuation, writing styles, and principles of writing in a particular area such as expository or creative writing.
- Skills in research, interpretation, and organizing materials.
- Knowledge of the publication industry.
- Skills in analyzing markets for writing.
- Skills in typing and word processing.
- Ability to persevere and withstand disappointments.

TRAINING

- Most employers require people in this field to have a bachelors degree in journalism or English.
- People applying for jobs should be able to demonstrate their writing skills through examples of their work, preferably published examples.
- Free-lance writers are not required to take any particular course work, but they will probably find formal training in writing helpful.

EDUCATIONAL PROGRAM

193	Journalism and Communications
441	English

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, grammar, literature, journalism, psychology, history, sociology, drama, media production, music, typing, and data processing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 78.
Guide for Occupational Exploration (2nd ed., 1984), pp. 81-83.
Occupational Outlook Handbook (1990-91 ed.), p. 173.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3220 DESIGNERS

OCCUPATIONAL DESCRIPTION

Designers plan products used in homes, businesses, and industries. They design all kinds of products including toys, furniture, cars, clothes, and bank notes. Some plan home and office decorations or design sets for movie, stage, and television productions. Others arrange flowers or design ads or displays for products, events, or services. Designers may use a variety of tools and equipment including artists' tools and hand and power equipment.

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Art Directors (141.031-010)
Graphic Designers (141.061-018) (32201)
Commercial Designers (141.081-014) (32202)
Interior Designers (142.051-014) (32203)
Clothes Designers (142.061-018) (32204)
Industrial Designers (142.061-026) (32205)
Floral Designers (142.081-010) (32206)
Merchandise Displayers (298.081-010) (32207)

NC'S RELATED OCCUPATIONS

1250	Marketing and Advertising Managers
1610	Architects
16101	Landscape Architects
1634	Industrial Engineers
1635	Mechanical Engineers
18543	Botanists
3250	Painters, Sculptors, Craft-Artists, and Artists-Printmakers
32501	Illustrators
32502	Painters (Fine Arts)
4030	Retail Sales Supervisors
4340	Retail Salespersons
5515	Horticultural Farmers
5622	Groundskeepers and Gardeners
6811	Tool and Die Makers
6852	Tailors and Dressmakers

WORK ACTIVITIES

- Receive assignments from customers or supervisors.
- Determine client preferences, purpose of design, and budget.
- Study styles and marketing trends.
- Make drawings, models, and plans and determine costs.
- Review and okay designs
- Prepare or supervise preparation of product or design.

APTITUDES

- Be able to learn principles and techniques of design.
- Have good verbal abilities for reading, writing, and speaking.
- Have good hand and finger dexterity and physical coordination.
- Be able to handle a variety of activities; make decisions based on observation, experience, and intuition; and work within set standards.
- Have good space and form perception and color coordination.
- Be able to get along with people and influence their decisions.
- Be creative and able to work under pressure.

WORK SETTING

Environment

Work indoors in offices, design studios, and retail areas.

Hours

Work 35 to 45 hours a week; evening, weekend, and longer hours possible.

Employers

Advertising agencies, educational institutions, newspapers, large businesses, publishing companies, retail stores, design studios, commercial printers, public relations departments, manufacturing companies, television production companies, architectural firms, large hotel and restaurant chains, consulting firms, and self-employed.

CONSIDERATIONS

- Job allows opportunity to see tangible results of work and to be creative.
- There may be pressure to meet deadlines and please customers.

NEBRASKA EMPLOYMENT

About 657 designers are projected to be employed by 1991.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for all designers range from $7,300 to $16,000 a year. Nationally, the median annual earnings of experienced full-time designers is approximately $27,500 a year. Depending on their talent and business ability, self-employed designers generally enjoy higher earnings than salaried designers.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors
- Employment opportunities in many of these jobs are affected by general economic conditions.
- Competition for entry-level positions is expected to be strong.

PREPARATION

SKILLS

- Knowledge of design practices and principles, business management, and sales techniques.
- Skills in drafting, drawing, and art.
- Skills in working with and persuading people.
- Skills in recordkeeping, decision making, planning, and supervising projects.

TRAINING

- The minimum educational requirement is a high school diploma.
- Many employers requiring training at a design school, technical school, community college, college, or university.
- Some employers may offer on-the-job training programs that usually last one or two years.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

115	Horticulture
131	Architectural and Environmental Design
133	Interior Design
144	Apparel Marketing
146	Marketing
311	Fine Arts
318	Graphics and Printing
391	Home Economics
395	Textiles and Clothing
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Complete courses in composition, speech, arts and crafts, marketing, commercial and graphic art, and business.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 81-83 and 220.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 175.

SCHOOLS

21801	Bellevue College
44820	Career Institute of Omaha
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
44822	Dory Passolt Models
21509	Hastings College
44823	International School of Modeling
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44824	Nancy Bounds International
44717	Nancy Bounds Modeling School and Agency-Lincoln
44802	Nebraska College of Business
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University (Lincoln)
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus

22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
99827	Universal Technical Institute
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

32201 GRAPHIC DESIGNERS

OCCUPATIONAL DESCRIPTION

Graphic designers create designs, illustrations, and layouts used to promote products and services, illustrate publications, and identify organizations. Their work appears in such visual communications media as magazines, books, television, greeting cards, billboards, catalogs, newspapers, calendars, and posters. DOT 141.061-018

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Military Graphic Designers and Illustrators (M32300)

NCIS RELATED OCCUPATIONS

3220	Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
32205	Industrial Designers
32206	Floral Designers
32207	Merchandise Displayers
3250	Painters, Sculptors, Craft-Artists, and Artists-Printmakers
32501	Illustrators
32502	Painters (Fine Arts)

WORK ACTIVITIES

- Plan layouts.
- Select type, styles, and colors.
- Prepare illustrations or photographs.
- Present ideas and preliminary sketches to clients or supervisors for approval.
- Modify layout as necessary.
- Prepare final art work for reproduction.
- Paste finished drawings and text on copyboards and add any hand lettering, instructions, and information on selection of colors, ink, and paper to be used.
- Submit layouts for final approval.

APTITUDES

- Be able to learn graphic design techniques.
- Be able to make visual comparisons, see slight differences in shapes and sizes, and distinguish colors.
- Have ability to visualize finished designs and two-dimensional respresentations of objects.
- Have good finger dexterity and hand coordination.
- Have good verbal ability to write instructions and check accuracy of written materials.
- Be creative and imaginative and able to work with abstract ideas.
- Be able to make decisions based on experience and practical application.

WORK SETTING

Environment
Work indoors in office areas.
Hours
Work 35 to 40 hours; evening and weekend hours may be required to meet deadlines.
Employers
Advertising agencies, educational institutions, newspapers, advertising departments of large firms, publishing companies, retail stores, design studios, commercial printers, and self-employed in design services.

CONSIDERATIONS

- There may be pressure to meet deadlines.
- Graphic designers usually buy their own tools.
- Workers must keep learning new techniques in the design field.

NEBRASKA EMPLOYMENT

About 660 designers are projected to be employed by 1991. Graphic designers are included in this group.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for graphic designers range from $10,000 to $16,000 a year. Nationally, the median annual earnings for all experienced full-time designers is approximately $27,500 a year. Salaries for graphic designers range from $10,200 to $32,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Favorable
Factors

- Employment in advertising is affected by general economic conditions.
- Competition for beginning jobs maybe strong.
- Growth in the number of consumer goods, competition in product markets, and self-service retail marketing add to employment increases.
- Prospects are best in the advertising and television centers of the country such as Los Angeles, New York, Chicago, and Detroit.

PREPARATION

SKILLS

- Knowledge of design techniques and principles, tools, layout, printing equipment, mechanical design equipment, and composition techniques.
- Skills in communication for writing, giving, and following directions.
- Skills in working with others.
- Skills in computer-aided graphic design and technical illustration.

TRAINING

- A bachelors degree in art is preferred, but some employers will hire people with two-year degrees in commercial design or graphic arts from technical schools and junior colleges.
- Apprenticeship programs sponsored by the Graphic Arts International Union also provide training.
- People applying for jobs should be able to demonstrate their artistic abilities through examples of their work.
- Training may be obtained though apprenticeship training.

EDUCATIONAL PROGRAM

318	Graphics and Printing
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, arts and crafts, media production, commercial and graphic art, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 81.
Guide for Occupational Exploration (2nd ed. 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 180.
Military Career Guide (1988-89 ed.), p. 52.

SCHOOLS

44820	Career Institute of Omaha
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21803	College of Saint Mary
21504	Concordia College
21606	Dana College
21311	Kearney State College
22803	Metropolitan Community College
22304	Mid-Plains Community College
99830	Omaha Opportunities Industrialization Center, Inc.
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
99827	Universal Technical Institute
21622	Wayne State College

32202 COMMERCIAL DESIGNERS

OCCUPATIONAL DESCRIPTION

Commercial designers create and design graphic material for decoration, illustration, or advertising on manufactured materials and packaging. DOT 141.081-014

HOLLAND CODE

AEI (Artistic, Enterprising, Investigative)

NCIS RELATED OCCUPATIONS

3220	Designers
32201	Graphic Designers
32203	Interior Designers
32204	Clothes Designers
32205	Industrial Designers
32206	Floral Designers
32207	Merchandise Displayers
3250	Painters, Sculptors, Craft-Artists, and Artists-Printmakers
32501	Illustrators
32502	Painters (Fine Arts)

WORK ACTIVITIES

- Receive assignments from customers or supervisor.
- Study various design styles.
- Review marketing trends of target market.
- Create, draw, and revise the design.
- Meet with client or supervisor to discuss the design.
- Make any necessary changes.
- Get final approval of design.
- Prepare design model including original artwork.
- Make silk screens, draw full-size patterns, and cut stencils.
- May work with specific items such as signs, wallpaper, tile or glassware.

APTITUDES

- Be able to learn commercial design techniques and practices.
- Have good verbal ability to work with clients and supervisors, check written materials for accuracy, and write instructions.
- Be able to visualize space distances and form relationships and perceive differences between colors.
- Have good finger dexterity and hand coordination.
- Be able to make judgments based on practical applications of design theory.
- Be creative and imaginative.
- Be able to work under pressure.

WORK SETTING

Environment

Work indoors in office areas.

Hours

Work 35 to 40 hours a week; some evening and weekend hours may be required to meet deadlines.

Employers

Advertising agencies, publishing companies, commercial printers, design studios, public relations departments, manufacturing firms, television production companies, newspapers, educational institutions, and self-employed as free-lance designers.

CONSIDERATIONS

- There is an opportunity to express ideas creativity and to see tangible results of those ideas.
- Job requires keeping up with new ideas, techniques, and changes in the field.
- There may be pressure to meet deadlines or please clients.

NEBRASKA EMPLOYMENT

About 1,310 artists and related workers are projected to be employed by 1991. Commercial designers are included in this group.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for commercial designers range from $10,800 to $20,800 a year. Nationally, the median annual earnings for all experienced full-time designers is $27,500 a year. Salaries for commercial designers range from $10,200 to $32,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors

- Growth in the number of consumer goods.
- Competition in product markets and self-service retail marketing all add to the need for commercial designers.
- Competition for entry-level positions is expected to be strong.
- Those skilled in the use of computers will be in greater demand.
- Prospects are best in large metropolitan centers such as New York, Chicago, Los Angeles, and Houston.

PREPARATION

SKILLS

- Knowledge of design techniques and principles, tools, paste-up and layout procedures, typesetting, and copy reproduction.
- Skills in art and lettering.
- Knowledge of advertising theory.
- Skills in communication for speaking and writing and following directions.
- Skills in working with others.

TRAINING

- A bachelors degree in art is usually preferred, but some employers hire people with two- or three-year degrees from art schools, technical schools, or junior colleges.
- Apprenticeship training is another form of preparation.
- People applying for jobs should be able to demonstrate their artistic skills through examples of their work.

EDUCATIONAL PROGRAM

318	Graphics and Printing
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, arts and crafts, media production, commercial and graphic art, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 81.

Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.

Occupational Outlook Handbook (1990-91 ed.), p. 180.

SCHOOLS

44820	Career Institute of Omaha
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21803	College of Saint Mary
21504	Concordia College
21606	Dana College
21311	Kearney State College
22803	Metropolitan Community College
22304	Mid-Plains Community College
99830	Omaha Opportunities Industrialization Center, Inc.
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
99827	Universal Technical Institute
21622	Wayne State College

32203 INTERIOR DESIGNERS

OCCUPATIONAL DESCRIPTION

Interior designers plan the interior spaces of commercial and residential buildings to make then useful or attractive. They may also design and decorate recreational vehicles and aircraft. Designers plan space based on the purpose of the area, the needs of the occupants, and the client's budget and taste. Jobs may range from performing a single task in a private residence to designing and coordinating the entire interior arrangement of a large building complex. DOT 142.051.014

HOLLAND CODE

AES (Artistic, Enterprising, Social)

NCIS RELATED OCCUPATIONS

1610	Architects
3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32204	Clothes Designers
32205	Industrial Designers
32206	Floral Designers
32207	Merchandise Displayers
3250	Painters, Sculptors, Craft-Artists, and Artists-Printmakers
32502	Painters (Fine Arts)

WORK ACTIVITIES

- Meet with client to learn preferences, purpose of area, and amount of money to be spent.
- Gather other necessary information such as traffic patterns, construction of rooms, and safety features.
- Prepare plans, sketches, and cost estimates and present to client.
- Arrange for and supervise any construction work.
- Design or choose furnishings, art work, and accessories.
- May plan all aspects of interior environments or advise clients on particular problems.

APTITUDES

- Be able to learn the basics of interior design.
- Have good verbal ability to communicate with clients, give directions, and check details in written materials.
- Be able to plan and organize projects and handle detailed paperwork.
- Have artistic abilities, a good sense of color harmony and combinations, and an understanding of space and form relationships.
- Be able to relate to people, interpret feelings and needs of clients, and influence them in making decisions.
- Have good eye-hand coordination and finger dexterity.

WORK SETTING

Environment

Work indoors in offices, merchandise display areas, and work areas; may travel to work sites or residences for conferences with clients.

Hours

Work 40 to 45 hours a week; schedule may be irregular and include evening and weekend hours.

Employers

Interior design firms, architectural firms, department and furniture stores, large hotel and restaurant chains, wallpaper and paint stores, and self-employed.

CONSIDERATIONS

- There is opportunity to be creative and see tangible results of ideas and work.
- Job may require working under pressure to meet deadlines.
- Beginning interior designers often work as sales representatives or showroom assistants before moving up to positions as designers.

NEBRASKA EMPLOYMENT

About 300 interior designers are projected to be employed by 1991.

WAGES

Entry level salaries for designers vary greatly according to type of employment and the talent and skill of the designer. In Nebraska, starting wages for interior designers range from $10,000 to $16,000 a year. Nationally, the median annual salary for all experienced full-time designers is

$27,500 a year. Salaries for interior designers range from $12,000 to $26,000 a year.

EMPLOYMENT OUTLOOK

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors

- Employment for the occupation is sensitive to the economy as consumers postpone this expense during economic slowdowns.
- Stiff competition exists especially for entry-level jobs.
- The growing tendency for furniture and department stores to hire designers and the increasing use of professional design services in private homes may increase the demand for designers.

PREPARATION

SKILLS

- Knowledge of interior design principles, color combinations, textures, styles, and materials.
- Skills in drafting and graphic art.
- Skills in working with and persuading all types of people.
- Skills in recordkeeping, decision, making and planning and supervising projects.
- Knowledge of sales techniques and business management.
- Skills in listening to and determining clients needs.

LICENSING OR CERTIFICATION

- For professional recognition, a designer may become a member of the American Society of Interior Design.
- To become a member, a person must complete a three- or four-year training program in interior design, complete several years of practical work experience, and pass an exam.

TRAINING

- Training options include two- or three-year programs or a four-year bachelors degree in interior design.
- Apprenticeships are available and usually last two years.

EDUCATIONAL PROGRAM

131	Architecture and Environmental Design
133	Interior Design
631	Apprenticeship

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, arts and crafts, clothing and textiles, marketing, commercial and graphic art, and drafting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 82.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 175.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22708	Southeast Community College-Beatrice Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

32204 CLOTHES DESIGNERS

OCCUPATIONAL DESCRIPTION

Clothes designers make new apparel designs. They make original drawings of apparel such as dresses, suits, shoes, or handbags. They may specialize in designing apparel for women, men, or children. DOT 142.061-018

HOLLAND CODE

ASR (Artistic, Social, Realistic)

NCIS RELATED OCCUPATIONS

3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32205	Industrial Designers
32206	Floral Designers
32207	Merchandise Displayers
3250	Painters, Sculptors, Craft-Artists, and Artist-Printmakers
32501	Illustrators
32502	Painters (Fine Arts)
6852	Tailors and Dressmakers

WORK ACTIVITIES

- Research design ideas and study public demands and current fashion trends.
- Make rough sketches or outlines of ideas.
- Determine cost of producing designs.
- Make final designs for approval by clients or management.
- Submit designs to be cut into master patterns.
- Drape, cut, and sew material into sample garments.
- Make necessary alterations and corrections in patterns.
- Display new styles to buyers and clients.
- May supervise work of design assistants.
- May research and design authentic period, country, or social class costumes for movie, television, or stage performances.

APTITUDES

- Be able to learn the principles and techniques of clothing design.
- Have good verbal ability for reading, writing, speaking, and checking accuracy.
- Have good space and form perception and color vision.
- Be able to handle a variety of tasks.
- Be able to make decisions based on observations and data.
- Have good hand and finger dexterity.
- Be able to work within set standards and precise measurements.

WORK SETTING

Environment

Work indoors in offices, sales areas of retail stores, display and fashion show areas, and production areas.

Hours

Work 40 hours a week; longer hours possible during seasonal periods of rushed work.

Employers

Textile and clothing manufacturers, design studios, specialty wholesaling studios, designer dress shops, and self-employed.

CONSIDERATIONS

- Job may require much travel.
- Job may involve pressure and stress when meeting deadlines or trying to respond to clients' needs.

NEBRASKA EMPLOYMENT

About 660 designers are projected to be employed by 1991. Clothes designers are in this group.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for clothes designers range from $9,000 to $16,000 a year. Nationally, the median annual salary for all experienced full-time designers is $27,500 a year. Salaries for clothes designers range from $12,000 to $26,000 a year.

EMPLOYMENT GROWTH

Nebraska

Unfavorable

National
Somewhat Favorable
Factors

- Opportunities are best in Los Angeles and New York where apparel factories and fashion houses are concentrated.
- People with good training and strong creative ability may have better job opportunities, but the competition is keen.

PREPARATION

SKILLS

- Knowledge of the fashion industry, textiles, and clothing design principles.
- Skills in design, drawing, pattern making, sewing, and fitting.
- Skills in estimating cost.
- Skills in buying and selling and relating to people.
- Skills in supervising, researching, and planning and organizing.

TRAINING

- Two to four years of training at community colleges, technical schools, or colleges or universities are usually required for clothes designers.
- After the person is hired, on-the-job training is usually provided by the employer.
- Previous work experience in sewing and tailoring, modeling, or selling clothing is helpful.
- Apprenticeships are available and usually last four years.

EDUCATIONAL PROGRAM

144	Apparel Marketing
391	Home Economics
395	Textiles and Clothing
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, history, arts and crafts, clothing and textiles, commercial and graphic art, and marketing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 82.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 175.

SCHOOLS

44820	Career Institute of Omaha
22307	Central Community College-Platte Campus
21102	Chadron State College
44822	Dory Passolt Models
44823	International School of Modeling
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44824	Nancy Bounds International
44717	Nancy Bounds Modeling School and Agency-Lincoln
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22517	York College

32205 INDUSTRIAL DESIGNERS

OCCUPATIONAL DESCRIPTION

Industrial designers develop and design manufactured products. The products include cars, home appliances, computers, filing cabinets, fishing rods, and piggy banks. DOT 142.061-026

HOLLAND CODE

AES (Artistic, Enterprising, Social)

NCIS RELATED OCCUPATIONS

1634	Industrial Engineers
1635	Mechanical Engineers
3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
32206	Floral Designers
32207	Merchandise Displayers
3712	Industrial Engineering Technologists and Technicians
3713	Mechanical Engineering Technologists and Technicians
6811	Tool and Die Makers

WORK ACTIVITIES

- Study research on product use, marketing, materials, and production methods.
- Organize and create methods.
- Evaluate designs according to appearance, usefulness, budget, and methods of production.
- Put together findings and designs and present to client or supervisor and make needed changes.
- Design product packaging and graphics for advertising and prepare illustrations and models.
- May specialize in certain product or type of product.

APTITUDES

- Be able to learn the principles and methods of industrial design.
- Have good verbal ability for reading, writing, and speaking.
- Be able to relate to people.
- Have good math and recordkeeping abilities.
- Be able to make decisions based on interpretation of needs, observation, and intuition.
- Have good space and form perception and sense of color coordination.
- Have good hand and finger dexterity and general coordination.
- Be creative, flexible, and able to work under pressure.

WORK SETTING

Environment
    Work indoors in offices, production areas, and laboratories.
Hours
    Work 40 hours a week.
Employers
    Manufacturing companies, architectural and design firms, consulting firms, and self-employed.

CONSIDERATIONS

- Most consultant industrial designers are employed in large cities such as New York, Chicago, and Los Angeles.
- Workers may face frustration when their designs are rejected and pressure to please clients.

NEBRASKA EMPLOYMENT

About 660 designers are projected to be employed by 1991. Industrial designers are included in this group.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for industrial designers range from $10,000 to $16,000 a year. Nationally, the median annual salary for all experienced full-time designers is $27,500 a year. Salaries for industrial designers range from $10,200 to $35,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Somewhat Favorable

Factors

- More emphasis on product quality, product safety, and environmental protection should create a demand for these workers in the future.
- Opportunities in this field are affected by changes in the economy.

PREPARATION

SKILLS

- Knowledge of industrial processes, design principles and methods, and business practices.
- Skills in artistic and mechanical drawing and creation of three-dimensional models.
- Skills in communication, planning, and evaluation.

TRAINING

- Most employers require a bachelors degree in industrial design.
- Eighteen schools in the United States have been accredited by the Industrial Designers Society of America.
- Apprenticeships are available and usually last four years.

EDUCATIONAL PROGRAM

251	Engineering
253	Engineering Technologies
318	Graphics and Printing
361	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, advanced math, chemistry, physics, arts and crafts, manufacturing, commercial and graphic art, drafting and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 82.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.) p. 173.

SCHOOLS

44820	Career Institute of Omaha
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11930	Colorado School of Mines
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11959	Hawkeye Institute of Technology
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
99827	Universal Technical Institute
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

32206 FLORAL DESIGNERS

OCCUPATIONAL DESCRIPTION

Floral designers create and prepare floral arrangements using fresh, dried, or artificial flowers and greenery. They work primarily in retail flower shops and often perform duties such as buying and selling of flowers, ornamental plants, and supplies. Some perform floral demonstration work. Others work for wholesale outlets or manufacturers or importers of floral products. DOT 142.081-010

HOLLAND CODE

RAE (Realistic, Artistic, Enterprising)

NCIS RELATED OCCUPATIONS

16101	Landscape Architects
18543	Botanists
3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
32205	Industrial Designers
32207	Merchandise Displayers
5515	Horticultural Farmers
5622	Groundskeepers and Gardeners

WORK ACTIVITIES

- Talk with client about purpose of arrangement, customer's preferences, and amount to be spent.
- Plan arrangement and choose flowers, foliage, and accessories.
- Arrange and trim flowers using wire, pins, floral tape, foam, trimmers, and cutters.
- Wrap, pack, and deliver completed arrangements.
- Decorate buildings or rooms for special events.
- Teach classes and give demonstrations.
- May manage flower shop and perform duties necessary for operation of retail business.

APTITUDES

- Have ability to learn techniques of floral arrangement and business management.
- Have verbal skills for reading, writing, speaking, and selling.
- Be able to see detail, visualize relationships and space distances, and mix and match colors.
- Have hand and finger dexterity and physical coordination.
- Be able to make decisions based on observations and experience.
- Be creative and like working with people as well as things.
- Be able to stand for long periods of time, lift containers of flowers, and reach for things.

WORK SETTING

Environment
Work indoors in work areas, offices, and display rooms; may work in areas that are cold and damp.
Hours
Work 40 to 48 hours a week; holidays are especially busy times and may require overtime hours.
Employers
Floral shops, large grocery stores, department stores, nurseries, greenhouses, and self-employed.

CONSIDERATIONS

- Job offers a chance to be creative.
- Worker must be able to work under stress at busy times.

NEBRASKA EMPLOYMENT

About 660 designers are projected to be employed by 1991. Floral designers are included in this group.

WAGES

Entry level salaries for designers vary greatly according to the type of employment and the talent and skill of the designer. In Nebraska, starting wages for floral designers range from $7,300 to $12,500 a year. Nationally, the entry level starting range is somewhat higher at $9,000 to $20,000 a year.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Somewhat Favorable

Factors

- Opportunities depend upon rising personal incomes and public interest in flowers and plants as gifts and decorations.
- There is less competition in smaller towns and rural areas.
- Demand is greatest for designers with formal training.

PREPARATION

SKILLS

- Knowledge of names, lasting qualities, seasonal availability, and prices of flowers and plants.
- Knowledge of flower and plant forms and floral design techniques.
- Skills in art, design, and speed.
- Skills in interpreting needs and giving and receiving instructions.
- Skills in working with people.
- Skills in business management.

TRAINING

- Applicants with design or art training are preferred.
- Formal training is available in commercial floral design schools, adult education courses, technical schools, and community colleges.
- Some employers provide on-the-job training which usually lasts about two years. A high school diploma is required for trainee positions.
- Apprenticeships are available and usually last one year.

EDUCATIONAL PROGRAM

115	Horticulture
221	Floral Design
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Complete high school courses in business practices, art and design, and agricultural subjects related to botany and horticulture.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 83.

Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.

Occupational Outlook Handbook (1990-91 ed.), p. 175.

SCHOOLS

11931	American Floral Art School
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
22803	Metropolitan Community College
22414	Nebraska College of Technical Agriculture
22306	Northeast Community College
11933	T. H. Pickens Technical Center
21718	University of Nebraska-Lincoln

32207 MERCHANDISE DISPLAYERS

OCCUPATIONAL DESCRIPTION

Merchandise displayers arrange products in windows and showcases and on sales floors of retail stores to get attention of customers. DOT 298.081-010

HOLLAND CODE

ARE (Artistic, Realistic, Enterprising)

NCIS RELATED OCCUPATIONS

1250	Marketing and Advertising Managers
3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
32205	Industrial Designers
32206	Floral Designers
4030	Retail Sales Supervisors
4340	Retail Salespersons

WORK ACTIVITIES

- Design sketches from ideas based on merchandise to be featured, location and size of display, and special themes.
- Build props and background settings.
- Arrange lighting for display.
- Select merchandise and gather manequins, furniture, and other props.
- Place items in position arranged according to design.
- Print and place price and description signs.
- Dismantle and remove old displays.

APTITUDES

- Be able to learn skills and methods of displaying merchandise.
- Have ability with words to communicate ideas and give instructions.
- Have numerical ability to figure budgets.
- Have good space and form perception and sense of color.
- Have good finger and hand dexterity and general physical coordination.
- Be able to make decisions based on set standards and influence people to buy through displays.
- Be creative.

WORK SETTING

Environment

Work indoors in offices, showroom settings, and retail stores.

Hours

Work 35 to 40 hours a week; longer hours may be required to complete special displays.

Employers

Department, variety, and other retail stores; manufacturing and wholesale firms; display companies; and self-employed.

CONSIDERATIONS

- Job offers chance to be creative.
- This field is very competitive and requires artistic ability to succeed.
- The work is physically active and requires considerable standing, bending, lifting, reaching, kneeling, and climbing.
- Displayers may work under pressure to complete projects on schedule.

NEBRASKA EMPLOYMENT

About 110 merchandise displayers are projected to be employed by 1991.

WAGES

Entry level salaries vary widely depending on the size and location of the employer as well as the creative talent of the displayer. In Nebraska, starting wages range from $8,800 to $16,000 a year. Nationally, entry level salaries are only slightly higher with a range of $9,000 to $18,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Favorable

Factors

- The competition for the few openings is keen.
- The majority of openings will result from the need to replace display workers who retire, are promoted, or transfer to other work.

- Best job opportunities are usually in large retail stores in metropolitan areas.

PREPARATION

SKILLS

- Knowledge of display techniques and advertising methods.
- Skills in art, design, and building.
- Skills in working with others and giving instructions.

TRAINING

- The minimum educational requirement is a high school diploma.
- Some employers prefer to hire workers who have completed college or techncial courses in display or a closely related field.
- On-the-job training is also available and may last one to two years.
- Apprenticeships are available and last one to four years.

EDUCATIONAL PROGRAM

144	Apparel Marketing
146	Marketing
311	Fine Arts
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Complete courses in arts and crafts, marketing, commercial and graphic art, woodworking, and drafting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 220.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.

SCHOOLS

21801	Bellevue College
44820	Career Institute of Omaha
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
44822	Dory Passolt Models
21509	Hastings College
44823	International School of Modeling
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44824	Nancy Bounds International
44717	Nancy Bounds Modeling School and Agency-Lincoln
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

3230 MUSICIANS AND COMPOSERS

OCCUPATIONAL DESCRIPTION

Musicians and composers write, arrange, sing, play, or direct music. They usually specialize in either popular or classical music. They may play a musical instrument, direct a symphony or choral group, or sing before audiences or on records. Others compose music for movies, operas, ballets and musical groups. Musicians may work alone or part of a group, and they may perform on radio, on stage, or in television or movie productions.

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Instrumental Musicians (152.041-010) (32301)
Choral Directors (152.047-010)
Orchestra Conductors (152.047-014)
Music Directors (152.047-018)
Singers (152.047-022) (32302)
Arrangers (152.067-010)
Composers (152.067-014)
Military Musicians (M32300)
Military Band Managers (M32301)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3240	Actors and Directors
32401	Actors
3270	Dancers
3330	Radio and Television Announcers
6172	Musical Instrument Repairers

WORK ACTIVITIES

- Play musical instruments.
- Interpret music through voice production.
- Create original music.
- Lead orchestras and bands.
- Plan sequence of musical numbers.
- Audition and select musicians.
- Direct rehearsals and performances.
- Make recordings.
- Give music instructions.

APTITUDES

- Be able to learn musical theory and techniques.
- Have musical talent.
- Be able to work with people.
- Have pleasing personality and showmanship.
- Have self-discipline, perseverance, and self-confidence.
- Be creative, diplomatic, and a leader.
- Have a good memory and sensitivity to audience responses.

WORK SETTING

Environment
Work indoors in rehearsal rooms and halls, clubs, classrooms, and concert halls; outdoors at musical performance sites; travel maybe required.

Hours
Hours are varied and irregular; usually includes evening and weekend hours; work may be part-time.

Employers
Educational institutions, bands, orchestras, radio, television, concert and choral groups, entertainment establishments, operas, movie companies, churches and synagogues, and self-employed.

CONSIDERATIONS

- Job may be rewarding because it allows creativity.
- Job may be prestigious, but work may not be steady.
- Periods of unemployment are common; so, many musicians earn income from other jobs.
- Most musicians belong to a union.

NEBRASKA EMPLOYMENT

About 380 musicians are projected to be employed by 1991.

WAGES

Salaries for musicians and composers vary widely depending on geographic location, the performer's professional reputation and the number of hours worked. In Nebraska, salaries range between $12,000 and $16,000 a year. Nationally salaries are somewhat higher with a range up to $20,000 a year. Most musicians and composers have additional incomes from teaching or other full-time employment.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors

- Competition is very strong for available positions. Most job opportunities will be short-term or part-time.

PREPARATION

SKILLS

- Knowledge of music theory and methods and the basics of music composition.
- Skills on one instrument or voice.
- Skills in managing groups.
- Skills in sight-reading, transposing, improvising, and quick memorizing.
- Skills in marketing.

TRAINING

- Formal training is usually necessary and usually begins at an early age.
- Training may include private lessons, music classes, and performance groups.
- Constant study, practice, and work experience is necessary.
- Degrees are not always required but the equivalent training is necessary.
- To teach music in elementary and secondary schools, a person must have a bachelors degree and be certified.
- To teach music in college, a person must have a masters degree or doctorate.

EDUCATIONAL PROGRAM

314 Music

HELPFUL HIGH SCHOOL SUBJECTS

Curriculum should include courses in music and drama and participation in music groups and theatre.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 86.
Guide for Occupational Exploration (2nd ed., 1984), pp. 94-96.
Occupational Outlook Handbook (1990-91 ed.), p. 185.
Military Career Guide (1988-89 ed.), pp. 55 and 274.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

32301 INSTRUMENTAL MUSICIANS

OCCUPATIONAL DESCRIPTION

Instrumental musicians play one or several types of musical instruments as soloists or as members of orchestras, bands, or ensembles to entertain audiences. DOT 152.041-010

HOLLAND CODE

ASI (Artistic, Social, Investigative)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3230	Musicians and Composers
32302	Singers
3240	Actors and Directors
32401	Actors
3270	Dancers
3330	Radio and Television Announcers
6172	Musical Instrument Repairers

WORK ACTIVITIES

- Practice alone and rehearse with groups.
- Plan sequence of musical numbers.
- Tune instruments and arrange equipment and music.
- Play instruments, follow direction of conductor, or improvise if necessary.
- Clean, polish, and tune instrument.
- May compose or arrange musical presentations.
- May make recordings.
- May give music instruction.
- May accompany other soloists.

APTITUDES

- Have ability to learn musical theory and techniques.
- Have musical talent and be able to express ideas and feelings through music.
- Have sensitivity to audience response.
- Be able to work with others.
- Have qualities of poise, creativity, determination, and self-discipline.
- Have a good memory.

WORK SETTING

Environment

Work indoors in rehearsal rooms and halls, clubs, classrooms, and concert halls; outdoors at musical performance sites; travel may be required.

Hours

Hours are varied and irregular; usually includes evening and weekend hours; work may be part-time.

Employers

Educational institutions, orchestras, dance bands, municipal bands, rock groups, ensembles, entertainment establishments, religious organizations, and self-employed.

CONSIDERATIONS

- Job may be rewarding because it allows creativity.
- Job may be prestigious, but work may not be steady.
- Many workers earn most of their income from other jobs.
- Most musicians belong to a union.

NEBRASKA EMPLOYMENT

About 270 instrumental musicians are projected to be employed by 1991.

WAGES

Salaries for instrumental musicians vary widely depending on geographic location, the performer's professional reputation and the number of hours worked. In Nebraska, salaries range between $12,000 and $16,000 a year. Nationally, salaries are somewhat higher with a range up to $20,000. Most instrumental musicians have additional incomes from teaching or other full-time employment.

EMPLOYMENT GROWTH

Nebraska

Unfavorable

National

Somewhat Favorable

Factors

- The number of people qualified for employment as instrumental musicians exceeds the positions available.
- Most job opportunities will be short-term or part-time.

PREPARATION

SKILLS

- Knowledge of music theory and methods and the basics of music composition.
- Skills in improvising.
- Skills in reading and interpreting music.
- Skills in marketing oneself.

TRAINING

- Training usually begins at an early age with private lessons and continues at all levels of education.
- Constant study, practice, and work experience is necessary.
- To teach music in elementary or secondary schools, a person must have a bachelors degree and be certified.
- To teach music in college, a person must have a masters degree or doctorate.

EDUCATIONAL PROGRAM

314 Music

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in music and participation in musical groups and theatre.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 86.
Guide for Occupational Exploration (2nd ed., 1984), pp. 94-96.
Occupational Outlook Handbook (1990-91 ed.), p. 185.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

32302 SINGERS

OCCUPATIONAL DESCRIPTION

Singers entertain audiences by using their voices to interpret music. Some are soloists, but most are part of a group. They may be accompanied by instruments or may sing acappella. Singers are classified by their voice range: soprano, contralto, tenor, baritone, or bass. They may specialize in one type of music such as opera, rock, folk, gospel, or country and western. DOT 152.047-022

HOLLAND CODE

AES (Artistic, Enterprising, Social)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3230	Musicians and Composers
32301	Instrumental Musicians
3240	Actors and Directors
32401	Actors
3270	Dancers
3330	Radio and Television Announcers

WORK ACTIVITIES

- Study and practice alone and with groups.
- Plan sequence of musical numbers.
- Sing with or without musical accompaniment.
- May make recordings.
- May give music instruction.
- May work as choir director.
- May compose or arrange musical presentations.

APTITUDES

- Be able to learn musical theory and techniques.
- Have musical talent and be able to express ideas and feelings through music.
- Be sensitive to audience response.
- Have a good memory.
- Be creative, poised, determined, and self-disciplined.
- Be able to work with others and be comfortable before an audience.

WORK SETTING

Environment
  Work indoors in rehearsal rooms and halls, clubs, classrooms, and concert halls; outdoors at musical performance sites; travel may be required.

Hours
  Hours are varied and irregular; usually includes evening and weekend hours; work may be part-time.

Employers
  Entertainment establishments, orchestras, choral groups, churches, educational institutions, theatre groups, movie companies, and self-employed.

CONSIDERATIONS

- Job may be rewarding because it allows creativity.
- Job may be prestigious, but work may not be steady.
- Many singers earn most of their income from other jobs.
- A singing career can be rather short.

NEBRASKA EMPLOYMENT

About 109 music directors and singers are projected to be employed by 1991.

WAGES

Salaries for professional singers vary widely depending on geographic location, the performer's professional reputation and the number of hours worked. . In Nebraska, salaries range between $12,000 and $16,000 a year. Nationally, salaries are somewhat higher with a range up to $20,000. Most professional singers have additional incomes from teaching or other full-time employment.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable

National
  Unfavorable

Factors
- Competition is strong for available positions.
- Most job opportunities will be short-term or part-time.

PREPARATION

SKILLS

- Knowledge of music theory and methods and the basics of music composition.
- Skill as a singer.
- Skills in sight-reading and reading and interpreting music.
- Skills in marketing oneself.

TRAINING

- Formal voice training is usually necessary.
- Training, study, and practice continue throughout a singer's career.
- Previous experience in musical groups may be helpful.
- To teach music in elementary or secondary schools, a person must have a bachelors degree and be certified.
- To teach music in college, a person must have a masters degree or doctorate.

EDUCATIONAL PROGRAM

314 Music

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in music and participation in musical groups and theatre.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 86.
Guide for Occupational Exploration (2nd ed., 1984), pp. 94-96.
Occupational Outlook Handbook (1990-91 ed.), p. 185.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3240 ACTORS AND DIRECTORS

OCCUPATIONAL DESCRIPTION

Actors and directors work in stage, movie, television, radio and other media productions. Some act out roles to entertain, inform, or instruct audiences. Others director or produce stage or screen productions. Directors plan and supervise radio, television, movie, and stage productions. Producers select scripts, control finances, and handle other production problems. DOT 150.047-010

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Stage Directors (150.067-010)
Motion Picture Directors (159.067-010)
Television Directors (159.067-014)(32402)
Producers (159.117-010) (32403)
Radio Directors (159.167-014)
News Directors (184.167-014)
Program Directors (184.167-030) (32404)
Broadcast Operations Directors (184.167-022)
Sports Directors (184.167-034)
Production Managers (184.167-074)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3230	Musicians and Composers
32301	Instrumental Musicians
32302	Singer
3270	Dancers
3312	Editors
3320	Public Relations Specialists
3330	Radio and Television Announcers
4450	Demonstrators, Promoters, and Models

WORK ACTIVITIES

- Choose scriptwriters for productions or select scripts.
- Choose cast members and conduct rehearsals.
- Analyze characters and memorize lines.
- Make production plans.
- Determine costs and arrange financing.
- Complete production.
- Negotiate for buying and selling of productions.
- Schedule work or programming.
- Teach or direct others.

APTITUDES

- Be able to learn procedures and principles of radio, television, theatre, or movie production.
- Have good verbal and math abilities.
- Be able to handle a variety of activities, plan and organize projects, and supervise others.
- Be creative, self-confident, and able to work under stress.
- Have ability to interpret feelings, attitudes, and opinions.

WORK SETTING

Environment

Work indoors in offices and production areas and on stages and sets and outdoors on location.

Hours

Work long, irregular hours including evenings, weekends, and holidays.

Employers

Television networks, commercial, public, or educational radio and television stations, theatres and playhouses, motion picture companies, repertory companies, advertising agencies, and educational institutions.

CONSIDERATIONS

- Job may be prestigious and allow for creativity.
- Work offers a variety of activities and contact with many people.
- Work may be stressful.

NEBRASKA EMPLOYMENT

About 198 actors, directors, producers, and entertainers are projected to be employed by 1991.

WAGES

Salaries vary widely for actors and directors depending on geographic location, the professional reputation of the actor or director and the length and terms of employment. In Nebraska, salaries range from $11,700 to $28,000 a year. Nationally, salaries span a wide range of $10,400 to $36,400 a year. Most actors and directors depend on additional employment until they have established their careers.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors

- The large number of people seeking these careers, the lack of formal entry requirements, and the small number of job openings cause keen competition.
- The growth of educational and cable television and acting companies and dinner theatres may provide some employment.

PREPARATION

SKILLS

- Knowledge of broadcasting methods; movie, theatre, and program production; and acting methods.
- Skills in communication and interpretation of ideas.
- Skills in management, organization, supervision, and recordkeeping.
- Skills in negotiating, selling, and decision making.

LICENSING OR CERTIFICATION

- Some directors and producers may be required to have a first class radio telephone operator license from the Federal Communications Commission (FCC).

TRAINING

- Most directors and producers are expected to have some college training.
- A bachelors degree in broadcasting or some related field is helpful.
- For actors, formal training is not required but is useful.
- Previous work experience in a related field is also helpful.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
316	Dramatic Arts
317	Film Arts
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, journalism, drama, music, and media production.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 85, 86, 89, and 114.
Guide for Occupational Exploration (2nd ed., 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), p. 182.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

32401 ACTORS

OCCUPATIONAL DESCRIPTION

Actors and actresses portray characters in plays, movies, and on television, through voice, body movement, and facial expressions. They memorize their lines and cues, rehearse their scenes, and must be able to project their roles to the audience. DOT 150.047-010

HOLLAND CODE

AES (Artistic, Enterprising, Social)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3230	Musicians and Composers
32301	Instrumental Musicians
32302	Singers
3240	Actors and Directors
32402	Television Directors
32403	Producers
32404	Program Directors
3270	Dancers
3330	Radio and Television Announcers
4450	Demonstrators, Promoters, and Models

WORK ACTIVITIES

- Study the script, analyze character, and memorize lines.
- Rehearse parts, lines, and cues.
- Perform on stage or television and in motion pictures.
- May be required to dance, sing, or apply make-up.
- May write or adapt materials.
- May work as an understudy or as an extra.
- May make personal appearances, endorse products, or do benefit shows.
- May teach drama or direct others.

APTITUDES

- Be able to learn general acting methods.
- Have ability to present information and ideas clearly.
- Be able to memorize lines and follow directions.
- Be able to work under stress and feel comfortable in front of others.
- Be creative.
- Be able to work with others.

WORK SETTING

Environment

Work indoors on stages and sets and outdoors on location; travel may be necessary.

Hours

Work long, irregular hours.

Employers

Repertory companies, dinner theatres, community playhouses, advertising agencies, television and motion picture companies, and educational institutions.

CONSIDERATIONS

- Work may be prestigious.
- Job allows creativity, but work may not be steady.
- Work may include long hours under hot lights in adverse weather conditions on location.
- Most actors belong to a union.
- Must be willing to work for little or no money in order to gain experience.

NEBRASKA EMPLOYMENT

About 190 actors, directors, producers, and entertainers are projected to be employed by 1991.

WAGES

Salaries vary widely for actors depending on geographic location, the professional reputation of the actor and the length and terms of employment. In Nebraska, salaries range from $11,700 to $28,000 a year. Nationally, salaries span a wide range of $10,400 to $36,400 a year. Most actors depend on addi-tional employment until they have established their careers and are in demand.

EMPLOYMENT GROWTH

Nebraska

Somewhat Favorable

National

Somewhat Favorable

Factors

- The large number of people seeking acting careers, the lack of formal entry requirements, and the small number of job openings cause keen competition.

- Growth of acting companies and dinner theatres may provide some employment.

PREPARATION

SKILLS

- Knowledge of acting methods.
- Skills in communication and interpretation of ideas.
- Skills in handling stress and rejection.
- Skills in memorization.
- Skills in singing and dancing may be necessary.

TRAINING

- Experience in high school, college, and community theatre is recommended.
- Formal training is not required but is useful for most actors.
- Specialized schools in Los Angeles and New York and colleges and universities offer dramatic training.
- To teach in college, a graduate degree is necessary.
- Apprenticeships are available.

EDUCATIONAL PROGRAM

316	Dramatic Arts
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Subjects should include a broad liberal arts background as well as courses in speech, sociology, psychology, music, media production, and art.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 85.
Guide for Occupational Exploration (2nd ed., 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), p. 182.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21504	Concordia College
21805	Creighton University
21507	Doane College
21509	Hastings College
21311	Kearney State College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

32402 TELEVISION DIRECTORS

OCCUPATIONAL DESCRIPTION

Television directors interpret scripts, direct technicians and actors, and conduct rehearsals to produce a final product for television. They use their knowledge of acting, voice, and movement to achieve the best possible performance. They also usually approve the scenery, costumes, choreography and music. DOT 159.067-014

HOLLAND CODE

SEA (Social, Enterprising, Artistic)

SPECIALTIES

Military Audiovisual Production Directors (M32402)

NCIS RELATED OCCUPATIONS

1341	Communications Operators Managers
1352	Recreation and Entertainment Managers
3240	Actors and Directors
32401	Actors
32403	Producers
32404	Program Directors
3312	Editors
3320	Public Relations Specialists
3330	Radio and Television Announcers

WORK ACTIVITIES

- Interpret scripts and choose cast members.
- Conduct rehearsals.
- Direct work of cast and crew.
- Confer with stage managers to make production plans.
- Approve scenery, costumes, lights, props, and other equipment.
- Give instructions during filming or telecast.
- May direct news, educational, or special programs or commercials.
- May work as producer-director.

APTITUDES

- Be able to learn the principles and methods of television production.
- Have good verbal abilities for reading, writing, and speaking.
- Have average ability with numbers and to see space and form relationships.
- Be able to handle a variety of tasks, plan and direct all aspects of a project, and make decisions based on observation.
- Be able to relate to people, handle detailed work accurately, and supervise others.
- Be creative, resourceful, and calm under pressure.

WORK SETTING

Environment
    Work indoors in offices and studios and outdoors on location.
Hours
    Work 40 hours a week with frequent overtime; may include evenings, weekends, and holidays.
Employers
    Commercial and noncommercial television stations.

CONSIDERATIONS

- Work may be prestigious and allow creativity.
- Job may involve work under pressure.

NEBRASKA EMPLOYMENT

About 198 producers, actors, and entertainers are projected to be employed by 1991. Television directors are included in this group.

WAGES

In Nebraska, entry level salaries range between $14,500 and $28,000 a year according to the size and location of the television station and the experience and professional reputation of the director. Nationally, starting salaries span a range between $14,000 and $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Somawhat Favorable
National
    Somewhat Favorable
Factors
- Competition is very strong in this field.
- The growth of educational and cable television will provide some jobs.

321

PREPARATION

SKILLS

- Knowledge of television broadcasting and program production.
- Knowledge of the technical aspects of camera work, electronic recording, and audio and video equipment.
- Skills in management, organization, and recordkeeping.
- Skills in writing and interpreting.

LICENSING OR CERTIFICATION

- Television directors may be required to have a first class radiotelephone operator license from the Federal Communications Commission (FCC) to be able to substitute for technicians or announcers in emergencies.

TRAINING

- A bachelors degree with a major in broadcasting, speech, journalism, or mass communications will improve job chances because employers prefer to hire people with college training.
- A graduate degree is recommended for those who want to work in educational television.
- Previous work experience as an announcer or technician in a television station may be helpful.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
316	Dramatic Arts
317	Film Arts
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, drama, music, and media production.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 89.
Guide for Occupational Exploration (2nd ed., 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), p. 182.
Mililtary Career Guide (1988-89 ed.), p. 273.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

32403 PRODUCERS

OCCUPATIONAL DESCRIPTION

Producers select plays or scripts and hire directors, cast members, and production staff members. They coordinate the activities of writers, directors, managers, nad other personnel, arrange financing, and determine the size of the production and its budget. DOT 159.117-010

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Military Audiovisual Production Specialists (M32403)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
3240	Actors and Directors
32401	Actors
32402	Television Directors
32404	Program Directors
3312	Editors
3320	Public Relations Specialists
3330	Radio and Television Announcers

WORK ACTIVITIES

- Choose script writers, outline program to them, approve finished script.
- Hire director, primary cast members, and production staff.
- Coordinate overall scheduling, technical, and production matters.
- Review production.
- Be responsible for financing production and overseeing the budget and production expenses.
- May represent network or station to independent producers.

APTITUDES

- Be able to learn the principles in radio, television, theatre, or movie production.
- Have very high verbal ability for reading, writing, and speaking.
- Be able to handle a variety of tasks, plan and organize a project, and supervise other workers.
- Be able to make judgments based on observation and practical applications.
- Have average ability with numbers and be able to see space and form relationships.
- Be able to work in stressful situations.

WORK SETTING

Environment
Work indoors in offices and studios and on stages and sets and outdoors on locations.
Hours
Work 40 hours a week with frequent longer hours; schedule may be irregular and include evenings and weekends.
Employers
Television and radio stations, theatres and playhouses, motion picture companies, and repretory companies.

CONSIDERATIONS

- Job may be prestigious.
- Work may be stressful.
- Job offers a variety of activities and contact with many people.

NEBRASKA EMPLOYMENT

About 198 producers, directors, actors, and entertainers are projected to be employed by 1991.

WAGES

In Nebraska, starting salaries range between $11,600 and $16,000 a year depending on the professional reputation of the producer as well as the length and terms of employment. Most producers in Nebraska contract for individual productions and must depend on additional employment to supplement their income. Nationally, salaries vary according to the type of production and the terms of the contract for that production. Producers are traditionally paid a percentage of the productions revenue.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable

Competition is very strong especially in large cities.
The growth of educational and cable television may provide some employment.

PREPARATION

SKILLS

- Knowledge of broadcasting methods; theatre, movie, and program production; and audio and video equipment.
- Skills in managing and supervising personnel.
- Skills in recordkeeping and planning budgets and financing.

LICENSING OR CERTIFICATION

- Radio producers may be required to have a first class radiotelephone operator license from the Federal Communications Commission (FCC) to be able to substitute for technicians and announcers in emergencies.

TRAINING

- Employers prefer to hire producers with some college training.
- A bachelors degree with a major in broadcasting, speech, journalism, or mass communications is good preparation for this career.
- A graduate degree is recommended for those who want to work in educational television.
- Most people begin work as directors or associate producers before advancing to producer.
- Previous work experience in media production is helpful.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
316	Dramatic Arts
317	Film Arts

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, drama, music, media production, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 89.
Guide for Occupational Exploration (2nd ed., 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), p. 182.
Military Career Guide (1988-89 ed.), p. 51.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

32404 PROGRAM DIRECTORS

OCCUPATIONAL DESCRIPTION

Program directors plan schedules and programming for radio or television stations or networks. DOT 184.167-030

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

NCIS RELATED OCCUPATIONS

1341	Communications Operations Managers
1352	Recreation and Entertainment Managers
3240	Actors and Directors
32401	Actors
32402	Television Directors
32403	Producers
3312	Editors
3320	Public Relations Specialists
3330	Radio and Television Announcers

WORK ACTIVITIES

- Determine type, time, and length of each program including ads and news.
- Buy programs from independent producers.
- Talk with directors and producers to solve production problems.
- Set work schedules for announcers.
- Audition and hire talent.
- Negotiate contracts for commercials.

APTITUDES

- Be able to learn the procedures and methods of program directing within the broadcast industry.
- Have good verbal and math abilities.
- Be able to handle a variety of activities and pay attention to details.
- Be able to direct and supervise people and projects, plan programs, and coordinate activities.
- Have ability to interpret feelings, attitudes, and opinions.
- Be able to make decisions based on observation and intuition.
- Be able to work under pressure.

WORK SETTING

Environment
Work indoors in offices, production areas, and editing rooms of radio or television stations.
Hours
Work 40 or more hours a week.
Employers
Television networks and commercial, public, or educational television or radio stations.

CONSIDERATIONS

- Job may be considered prestigious.
- Work may include long hours and pressure.
- Program directors may be responsible for the entire success or failure of programming for their particular station or network.

NEBRASKA EMPLOYMENT

About 198 producers, directors, actors, and entertainers are projected to be employed by 1991. Program directors are included in this group.

WAGES

Starting salaries for program directors vary according to the size and location of the radio or television station as well as the experience and professional reputation of the director. In Nebraska, experienced program directors start within a range of $17,000 to $28,000 a year. Nationally, salaries are more competitive with an upper range of $40,000 a year.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors
- Competition for these jobs is strong because this is a small occupational group with few openings.
- The growth of educational and cable television, public radio, and the use of television in educational settings may add to the need for these workers.

PREPARATION

SKILLS

- Knowledge of the techniques and procedures of television or radio braodcasting.
- Skills in planning programs, directing productions, and supervising staff.
- Skills in negotiating, selling, and decision making.
- Skills in interviewing and selecting personnel.

LICENSING OR CERTIFICATION

- Some program directors maybe required to have a first class radiotelephone operator license from the Federal Communications Commission (FCC).

TRAINING

- Most employers require program directors to have a bachelors degree in broadcasting or a related area such as journalism or mass communication.
- Work experience in broadcasting at lower levels is usually necessary before being hired as a program director.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
316	Dramatic Arts
317	Film Arts

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, journalism, drama, media production, and music.

BIBLIOGRAPHY

Dictionary of Occupation Titles (4th ed., 1977), p. 114.
Guide for Occupational Exploration (2nd ed., 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), p. 182.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3250 PAINTERS, SCULPTORS, CRAFT-ARTISTS, AND ARTIST-PRINTMAKERS

OCCUPATIONAL DESCRIPTION

Painters, sculptors, craft-artists, and artist-printmakers create, copy, or restore paintings, drawings, sculpture, and other art works. They may create art works or designs for use in business or industry or as decorations. Their duties range from designing and constructing movie scenery to creating original paintings or sculptures. They may create designs to illustrate books, advertise products, or show medical procedures. They use a variety of tools and materials.

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Cartoonists (141.061-010)
Fashion Artists (141.061-014)
Illustrators (141.061-022) (32501)
Medical and Scientific Illustrators (141.061-026)
Set Illustrators (141.061-030)
Motion Picture Cartoonists (141.081-010)
Painters (Fine Arts) (144.061-010) (32502)
Printmaker (144.061-014)
Sculptor (144.061-018)
Quick Sketch Artists (149.041-010)
Modeler (777.081-010)

NCIS RELATED OCCUPATIONS

3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
3260	Photographers
3720	Drafters

WORK ACTIVITIES

- Paint a variety of original pictures using a variety of medium and surfaces.
- Design and construct two- or three-dimensional art works.
- Draw cartoons for readers' amusement or to interpret or highlight ideas.
- Sketch pictures of customers from photographs or posed subjects.
- Create illustrations to convey messages or influence people.
- Meet with clients or participate in art showings.
- May teach classes.

APTITUDES

- Be able to learn principles and methods of art.
- Have artistic talent.
- Be creative, imaginative, self-disciplined, and able to persevere.
- Be able to express feelings and ideas in visual forms.
- Have good hand and finger dexterity, eye-hand coordination, space and form perception, and ability to mix and match colors.
- Have good verbal abilities.

WORK SETTING

Environment

Work indoors in studios, offices, and classrooms and outdoors where scenes are being painted; travel may be required.

Hours

Work 40 hours a week or more; some individuals may decide the number of hours worked; hours may be long and irregular.

Employers

Self-employed, educational institutions, government agencies, art museums, advertising agencies, art studios, publishing industry, television and movie studios, and manufacturing firms.

CONSIDERATIONS

- Work may be rewarding and allow creativity.
- Job may be stressful when meeting deadlines, pleasing clients' wishes, and trying to make enough money for a living.
- May be necessary to locate in large cities on East or West Coasts.

NEBRASKA EMPLOYMENT

About 1,310 artists and related workers are projected to be employed by 1991.

WAGES

First year earnings for self-employed artists in Nebraska are quite low. Most working artists have full-time employment in a related occupation. Earnings for all employed artists in Nebraska range from $10,800 to $20,000 a year depending on the size and location of the employer as well as the extent of the duties and responsibilities assigned to the position. Art instructors in public and private schools are included in this group. Nationally, salaries span an extremely broad range of between $10,800 and $50,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Unfavorable
Factors
- The number of students graduating with degrees in art far exceeds the positions available.
- Prospects depend upon public and private support for art.

PREPARATION

SKILLS

- Knowledge of the techniques related to the artist's medium.
- Knowledge of the theory, background, and history of art.
- Artistic talent.
- Skills in decision making and communication.
- Skills in business management, public relations, and marketing.

TRAINING

- For some there are no special educational requirements.
- Employers prefer to hire people with degrees and training.
- Training programs are available from art and technical schools, colleges, and universities.
- Work experience and apprenticeship are two other forms of training.
- A bachelors degree and certification are required to teach in elementary and secondary schools.
- Advanced degrees are necessary to teach in colleges and universities.

EDUCATIONAL PROGRAM

311	Fine Arts
318	Graphics and Printing
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in literature, speech, journalism, arts and crafts, media production, commercial and graphic art, and marketing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 81, 84-85, and 767.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 180.

SCHOOLS

21801	Bellevue College
44820	Career Institute of Omaha
22501	Central Community College-Hastings
22307	Central Community College-Platte
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
22512	Southeast Community College-Milford
21717	Union College
99827	Universal Technical Institute
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

32501 ILLUSTRATORS

OCCUPATIONAL DESCRIPTION

Illustrators paint or draw pictures to explain the printed or spoken word for books, magazines, newspapers, greeting cards, catalogs, posters, and films. DOT 141.061-022

HOLLAND CODE

AES (Artistic, Enterprising, Social)

SPECIALTIES

Fashion Artists (141.061-014)
Medical and Scientific Illustrators (141.061-026)
Set Illustrators (141.061-030)

NCIS RELATED OCCUPATIONS

3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32204	Clothes Designers
3250	Painters, Sculptors, Craft-Artists, and Artist-Printmakers
32502	Painters
3260	Photographers
3720	Drafters

WORK ACTIVITIES

- Talk with clients, editors, or art directors to decide type of artwork needed, message to be conveyed, and people to be influenced.
- Decide style, technique, and medium best suited to get effect wanted.
- Form concepts and create illustrations.
- Choose paper stock, style of type, and colors.

APTITUDES

- Be able to learn the principles and methods of media illustrations.
- Have strong verbal abilities.
- Be able to express feelings and ideas in visual forms.
- Have good space and form perception and hand and finger dexterity.
- Have artistic talent and normal vision.
- Be creative and imaginative.

WORK SETTING

Environment
Work indoors in office settings.
Hours
Work 35 to 40 hours a week with longer or evening hours necessary to meet deadlines.
Employers
Advertising agencies, graphic art studios, publishing industry, manufacturing firms, government agencies, and self-employed.

CONSIDERATIONS

- Work can be satisfying when finished product is seen.
- Worker can use imagination and creativity.
- Job may be stressful when working under pressure to meet deadlines.

NEBRASKA EMPLOYMENT

About 1,310 artists and related workers are projected to be employed by 1991. Illustrators are included in this group.

WAGES

Entry level salaries for illustrators vary according to the demonstrated talent, training and area of specialization of the artist as well as the type of employment. In Nebraska, starting salaries range between $10,800 and $20,800 a year. Nationally, beginning salaries span a broader range of between $10,200 and $50,000 a year. Many illustrators supplement their salaried income with freelance work.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Somewhat Favorable
Factors
- Competition is very strong in this field; so, those with specialized training and/or work experience will have the best chances.
- Changes in the economy will effect job opportunities.
- The growing use of visual advertising will add to the need for illustrators.

PREPARATION

SKILLS

- Knowledge of commercial design, printing, platemaking, typography, and production methods.
- Skills in drawing and graphic design.
- Skills in communication and decision making.

TRAINING

- Most employers prefer to hire people with college degrees in graphic design or commercial art.
- Some employers will hire people who have graduated from two-year programs in technical schools and community colleges.
- Work experience and apprenticeship are two other forms of training.

EDUCATIONAL PROGRAM

311	Fine Arts
318	Graphics and Printing
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in literature, journalism, arts and crafts, media production, and commercial and graphic art.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 81.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.) p. 180.

SCHOOLS

21801	Bellevue College
44820	Career Institute of Omaha
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
99827	Universal Technical Institute
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

32502 PAINTERS (FINE ARTS)

OCCUPATIONAL DESCRIPTION

Painters create a variety of original pictures such as landscapes, portraits, still lifes, and abstracts using watercolors, oils, acrylics, tempera, or other types of paints. DOT 144.061-010

HOLLAND CODE

ASI (Artistic, Social, Investigative)

NCIS RELATED OCCUPATIONS

3220	Designers
32201	Graphic Designers
32202	Commercial Designers
32203	Interior Designers
32204	Clothes Designers
3250	Painters, Sculptors, Craft-Artists, and Artist-Printmakers
32501	Illustrators
3260	Photographers

WORK ACTIVITIES

- Create and develop ideas for painting.
- Apply color medium to canvas or other surface using brushes and other artists' tools.
- Put together line, space, mass, and color components to produce the desired effect.
- Coat finished product with a preservative.
- May work in other art media such as etching, drawing, or graphics.
- May teach art classes.

APTITUDES

- Have ability to learn principles, basics, and methods of art.
- Have high verbal ability.
- Be able to interpret and express feelings and ideas through paintings.
- Have good hand and finger dexterity, ability to mix and match colors, good eye-hand coordination, and good space and form perception.
- Be able to make judgments based on observations and practical applications and to work within exact standards of measurement.
- Have qualities of creativity, artistic talent, curiosity, imagination, self-discipline, and perseverance.

WORK SETTING

Environment

Work indoors in studios, classrooms, and offices and outdoors in various settings where scenes are being painted; travel may be necessary.

Hours

Number of hours worked is decided by the individual; hours may be long and irregular.

Employers

Self-employed as free-lance artists, educational institutions, government agencies, and art museums.

CONSIDERATIONS

- Job may be rewarding and allow creativity.
- Since it is difficult to earn a living in this field, many painters earn extra money in other jobs.
- Locating in large cities or traveling to show and sell completed works may be necessary.

NEBRASKA EMPLOYMENT

About 1,310 artists and related workers are projected to be employed by 1991. Painters are included in this group.

WAGES

First year earnings for self-employed artists in Nebraska are quite low. Most working artists have full-time employment in a related occupation. Earnings for all employed artists in Nebraska range from $10,800 to $20,000 a year depending on the size and location of the employer as well as the extent of the duties and responsibilities assigned to the position. Art instructors in public and private schools are included in this group. Nationally, salaries span an extremely broad range of between $10,800 to $50,000 a year.

EMPLOYMENT GROWTH

Nebraska

Somewhat Favorable

National

Unfavorable

Factors

- The field is overcrowded and competition is very strong.

- Prospects are limited by continued government cutbacks for the arts.

PREPARATION

SKILLS

- Knowledge of colors, paints, tools, brushes, and canvasses.
- Knowledge of theory, background, and history of art.
- Natural artistic talent.
- Skills in business management, public relations, and marketing.

TRAINING

- There are no special educational requirements, but most receive some special training in art.
- Training programs are available from art schools, community colleges, and universities.
- Previous work experience is helpful.
- A bachelors degree and certification are necessary to teach in elementary and secondary schools.
- Advanced degrees are necessary to teach in postsecondary schools.

EDUCATIONAL PROGRAM

311 Fine Arts

HELPFUL HIGH SCHOOL SUBJECTS

Subjects should include courses in arts and crafts, commercial and graphic art, English, speech, and marketing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 84.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-89.
Occupational Outlook Handbook (1990-91 ed.), p. 180.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3260 PHOTOGRAPHERS

OCCUPATIONAL DESCRIPTION

Photographers use their cameras and film to take pictures of people, places, events, products, and scenes. They work with films, lenses, filters, and lighting to produce desired effects. Some develop and print their own photographs and may enlarge or alter the basic image. Many specialize in a certain type of photography such as portrait, commercial, or industrial.

HOLLAND CODE

ASE (Artistic, Social, Enterprising)

SPECIALTIES

Directors of Photography (143.062-010)
Aerial Photographers (143.062.014)
Motion Picture Photographers (143.063-022)
Scientific Photographers (143.062-026)
Still Photographers (143.062-030)
Photojournalists (143.062-034)
Biological Photographers (143.362-010)
Finish Photographers (143.382-014)
Military Photographers (M32600)
Military Motion Picture Camera Operators (M32601)

NCIS RELATED OCCUPATIONS

3250	Painters, Sculptors, Craft-Artists, and Artist-Printmakers
32501	Illustrators
32502	Painters (Fine Arts)
6868	Photographic Process Workers

WORK ACTIVITIES

- Study the situations, materials, or subjects to be photographed.
- Determine the precise distances, lighting requirements, and lenses to be used.
- Operate cameras and other photographic equipment.
- Assist people to be photographed to ensure ideal pictures.
- Some develop exposed film and prepare pictures.

APTITUDES

- Be able to learn the use of photography equipment and techniques.
- Have good space and form perception, hand and finger dexterity, and sense of color.
- Be able to work with people and interpret and express the wishes of clients.
- Be able to work within set limits and precise measurements and make decisions based on observation and intuition.
- Have good use of numbers and words.
- Be creative and talented.

WORK SETTING

Environment

Work indoors in studios and offices and outdoors on sets and locations; some travel may be necessary.

Hours

Work forty or more hours a week; weekend and evening hours may be necessary; overtime hours may be required to meet deadlines.

Employers

Commercial and portrait studios, newspapers, and magazines, television stations, colleges and universities, scientific and industrial firms, medical centers, motion picture studios, government agencies, and self-employed.

CONSIDERATIONS

- Job may be rewarding and allow for creativity.
- Light lifting may be required.
- Photographers may experience stress when working to meet deadlines or when working to meet clients' demands.

NEBRASKA EMPLOYMENT

About 600 photographers are projected to be employed by 1991.

WAGES

Starting salaries for photographers in Nebraska range from $14,700 to $22,000 a year depending on geographic location, demonstrated talent of the photographer and the type of employment. Nationally, salaries range from $10,000 to $26,000 a year. Some freelance and self-employed photographers earn more than salaried workers. Many do not.

EMPLOYMENT GROWTH

Nebraska
Somewhat Favorable
National
Favorable
Factors

- Employment opportunities will be best in the areas of management, photo processing, and science and engineering photography.
- Competition for entry-level positions is keen.
- The economy affects the amount of work for photographers; they are not usually as busy during poor economic times because photos are not a necessity.

PREPARATION

SKILLS

- Knowledge of cameras, lighting, composition, darkroom procedures, and special properties of film and paper.
- Skills in using the metric system.
- Skills in working with people.
- Knowledge of business and accounting practices.
- Skills in verbal communication.

LICENSING OR CERTIFICATION

- Certification by the Professional Photographers of America is not required but can bring professional status.
- Certification is earned through a series of tests, continuing education, and evaluations of a person's work.

TRAINING

- Entry-level positions have no formal training or education requirements.
- Postsecondary training is necessary for industrial or scientific photography.
- There are several methods of acquiring photographic skill including on-the-job training, course work in art schools, community colleges, and universities, development of skill through a hobby, and apprenticeship training.
- Those interested in photojournalism need a background in journalism.
- Training in several specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

193	Journalism and Communications
317	Film Arts
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in journalism, chemistry, physics, arts and crafts, media production, and commercial and graphic art.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 83-84.
Guide for Occupational Exploration (2nd ed., 1984), pp. 84-87.
Occupational Outlook Handbook (1990-91 ed.), p. 177.
Military Career Guide (1988-89 ed.), pp. 54 and 56.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22306	Northeast Community College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3270 DANCERS

OCCUPATIONAL DESCRIPTION

Dancers create and perform dances. They use movement to interpret an idea or story or to express rhythm and sound. They may perform in ballets, in musical shows, in folk and jazz dances, or in other kinds of dancing. They may work in a group, with a partner, or by themselves. They may act and sing as well as dance in movies, opera, or television shows. May dancers combine stage work with teaching. Some become choreographers who create new dances and teach them to performers and sometimes direct and stage dance routines. DOT 151.027-010, 151.047-010

HOLLAND CODE

AES (Artistic, Enterprising, Social)

NCIS RELATED OCCUPATIONS

2033	Recreation Workers
3230	Musicians and Composers
32301	Instrumental Musicians
32302	Singers
3240	Actors and Singers
32401	Actors

WORK ACTIVITIES

- Communicate ideas, moods, and emotions through formal and freestyle dancing.
- Learn and practice dances and dance techniques.
- Audition and rehearse for public appearances.
- Create new dances and dance productions.
- Guide dance performers to achieve the desired effect of choreography.
- Plan and direct rehearsals.
- Give dance lessons.
- Plan and administer dance therapy programs.

APTITUDES

- Be able to learn the basics of dance and gain an understanding of the arts.
- Have ability to use words and numbers.
- Have good space and form perception, eye-hand-foot coordination, and physical coordination.
- Be creative and able to judge distances, use exact timing, and make precise movements.
- Be able to work within set limits and make decisions based on experience.
- Be able to accept criticism and work under pressure.
- Have drive and ambition.

WORK SETTING

Environment

Work indoors in studios or on stages and sets; travel may be necessary.

Hours

Hours vary greatly; during rehearsals, the work week is usually 30 hours; during performance periods, the work schedule may be heavier; hours are irregular and include evenings and weekends.

Employers

Dance companies, theatrical and ballet companies, educational institutions, television and motion picture studios, large hotels and clubs, and self-employed.

CONSIDERATIONS

- Job may be prestigious and allows creativity.
- Many dancers work in related fields and retire in their thirties.
- Most dancers belong to a union.
- Most opportunities are outside Nebraska.

NEBRASKA EMPLOYMENT

Very few dancers are projected to be employed by 1991.

WAGES

Because so few Nebraskans are employed in this occupation, salary information is not available. Nationally, earnings are determined by union contracts. The unions and producers sign basic agreements specifying minimum salary rates, hours of work, and other conditions of employment. Dancers on tour usually are compensated at a higher rate than dancers in single or extended performances at one location. Most dancers must supplement their income with unrelated jobs.

EMPLOYMENT GROWTH

Nebraska

Unfavorable

National

Somewhat Favorable

Factors

- Competition is very strong because the supply of dancers is much larger than the demand.
- Success largely depends on talent.
- Teaching dance offers the best opportunities.

PREPARATION

SKILLS

- Knowledge of music, literature, and basic dance steps and routines.
- Skills in dancing.
- Skills in working with others and following directions.

TRAINING

- Training usually begins with lessons from private dance teachers at an early age.
- Training and practice continues throughout professional employment.
- Professional schools of dance offer formal training for advanced students.
- College degrees are offered in dance.
- Advanced degrees are required to teach on the college or university level.
- Previous work experience in school or community productions is helpful.

EDUCATIONAL PROGRAM

315	Dance
316	Dramatic Arts

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in speech, music, literature, art, history, drama, physical education, and anatomy.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 86.
Guide for Occupational Exploration (2nd ed., 1984), pp. 97-99.
Occupational Outlook Handbook (1990-91 ed.) p. 183.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21504	Concordia College
21805	Creighton University
21507	Doane College
21509	Hastings College
21311	Kearney State College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3290 INTERPRETERS

OCCUPATIONAL DESCRIPTION

Interpreters translate spoken or written words from one language to another. Foreign language interpreters convert one spoken or written language into another. Sign language interpreters, also called interpreters for the deaf or hearing impaired, translate spoken language into sign language and vice versa so that deaf and hearing people can communicate. DOT 137.267-010

HOLLAND CODE

SAE (Social, Artistic, Enterprising)

SPECIALTIES

Interpreters of the Deaf (137.267-014)
Translators (137.267-018)
Military Interpreters and Translators (M32900)

WORK ACTIVITIES

- Listen to complete statements in one language, translate to second, and translate responses from second into first language.
- Present oral interpretation of materials at time it is being spoken.
- Read materials and rewrite in specified language or languages.
- Translate spoken material into sign language for understanding for hearing impaired.
- Interpret sign language of hearing impaired into oral and written language for hearing individuals.

APTITUDES

- Be able to learn foreign or sign languages.
- Have excellent use of words and average use of numbers.
- Be able to check accuracy of words and make decisions based on data and experience.
- Be able to picture objects from sketches and descriptions and see slight differences in objects.
- Have good eye-hand coordination and hand and finger dexterity.
- Be able to work with a variety of people.

WORK SETTING

Environment
: Work indoors usually; may have to travel to conferences.

Hours
: Varies; conference and consecutive interpreters usually work six hours a day; simultaneous interpreters usually work 150 days a year.

Employers
: Government agencies, international organizations, international companies, large newspapers, radio and television networks, colleges and universities, public schools, airlines, and self-employed.

CONSIDERATIONS

- Simultaneous interpreting is a very high pressure, grueling job.
- Self-employed or freelance sign language interpreters are often on call twenty-four hours a day.
- Most job opportunities for foreign language interpreters are in large, metropolitan cities.

NEBRASKA EMPLOYMENT

In Nebraska, many sign language interpreters work on a free-lance basis. Very few foreign language interpreters are employed in Nebraska. About 66 sign language interpreters are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries range between $9,000 and $25,000 a year depending on experience, proficiency, and training completed. Nationally, starting salaries for all interpreters span a very broad range of between $8,000 and $45,000 a year.

EMPLOYMENT GROWTH

Nebraska
: Unfavorable for foreign language interpreters; Somewhat favorable for sign language interpreters.

National
: Unfavorable for foreign language interpreters; Favorable for sign language interpreters.

Factors

- For foreign language interpreters full-time work is limited, competition is keen, and turnover is low.
- Laws require that services of federally funded programs be available to the deaf which increases demand for sign language interpreters.
- Demand for sign language interpreters will increase as schools mainstream hearing impaired students.

PREPARATION

SKILLS

- Knowledge of foreign or sign language.
- Knowledge of slight nuances between words.
- Knowledge of cultures and cross-cultural communication and international affairs.
- Skills in writing.
- Skills in using vocabulary and grammar of English and sign language.
- Skills in listening and interpreting meaning of words.
- Skills in hearing and understanding more than one conversation at once.

LICENSING OR CERTIFICATION

- Certification is available for sign language interpreters from the National Registry of Interpreters for the Deaf.

TRAINING

- For foreign language interpreters the minimum educational requirement is a four-year or advanced degree with a proven fluency in at least two languages.
- It is helpful to have lived in a country where your chosen language is spoken.
- Those who are proficient in a foreign language and have training in another area such as business or accounting may find the best job opportunities.
- Many employers require that sign language interpreters complete a training program or have a proven ability to sign.
- Most sign training programs last two years and lead to an associate degree.

EDUCATIONAL PROGRAM

237	Special Education
445	Foreign Languages

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should follow a college preparatory curriculum including courses in word processing, foreign language, and as many courses in writing, speaking, and reading English as possible.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 80.
Guide for Occupational Exploration (2nd ed., 1984), pp. 554-557.
Military Career Guide (1988-89 ed.) p. 53

SCHOOLS

21801	Bellevue College
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3312 EDITORS

OCCUPATIONAL DESCRIPTION

Editors plan and supervise the production of publications such as magazines, news-papers, books, and newsletters and of movie or television stations or similar organ-izations. They hire, assign, and supervise staff who write articles, reports, editorials, reviews, and other materials. They may supervise workers who gather and edit news, photograph news events, prepare scripts, or revise material to be published. DOT 132.017-018

HOLLAND CODE

ASE (Artistic, Social, Enterprising)

SPECIALTIES

Newspaper Editors (132.017-014)
City Editors (132.037-014)
Department Editors (132.037-018)
Publications Editors (132.037-022)
Bureau Chiefs (132.067-010)
Book Editors (132.067-014)
News Editors (132.067-026)
Editorial Assistants (132.267-014)
Managing Newspaper Editors (142.017-010)

NCIS RELATED OCCUPATIONS

3210	Authors
3240	Actors and Directors
32402	Television Directors
32403	Producers
32404	Program Directors
3313	Reporters
3320	Public Relations Specialists
3330	Radio and Television Announcers

WORK ACTIVITIES

- See that materials to be published or broadcast meet editorial policies of employing organization.
- Supervise and coordinate the activities of personnel.
- Plan physical layouts of news items.
- Select stories and assign them to reporters or writers.
- Designate space and position of articles, photographs, illustrations, and advertisements.
- Issue written copy to copy readers.
- May write editorials.
- Hire staff members.
- Check accuracy of all new copy.
- Select and edit books to be published.

APTITUDES

- Be able to learn the techniques of journalism and publication editing and a broad range of subject areas.
- Have very high verbal abilities.
- Be able to pay attention to details, work with numbers, and made decisions based on observation and intuition.
- Be able to organize, coordinate, and direct staff, projects, and activities.
- Have ability to influence people's thinking and interpret people's feelings and values.
- Be able to handle pressure.

WORK SETTING

Environment

Work indoors in offices, meeting rooms, and production areas.

Hours

Work 40 or more hours a week; hours may be long and irregular.

Employers

Newspapers, magazine publishers, book publishers, public relations firms, insurance companies, private businesses, industrial firms, educational institutions, government agencies, professional associations, non-profit organizations, religious groups, broadcasting firms, advertising agencies, and self-employed.

CONSIDERATIONS

- Job may carry prestige.
- Editors must take a stand on certain issues, be willing to back those opinions, and face public disagreement.
- Those who edit small town newspapers may also handle other duties such as reporting or photography.
- Editors of magazines, book publishers, public relations firms, and advertising agencies tend to be located in major cities.

NEBRASKA EMPLOYMENT

About 793 editors and writers are projected to be employed by 1991.

WAGES

Starting salaries for editors and writers vary according to experience and educational background, and size and location of the employer. In Nebraska, entry level salaries range between $15,800 and $20,000 a year. National, starting salary figures are comparable to Nebraska with a somewhat higher upper range of $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Favorable
Factors

- Prospects will be most favorable in technical writing for business and trade publications and for those working in radio and television broadcasting.
- The supply of newspaper and magazine editors is greater than the demand.
- Opportunities for newspaper editors may be better in small towns and rural areas than in large cities.

PREPARATION

SKILLS

- Knowledge of publication methods, writing and editing, photography, layout, graphics, and community resources.
- Broad knowledge of many subjects and an awareness of important issues.
- Skills in speaking, writing, grammar, and spelling.
- Skills in supervising, organizing, and coordinating.
- Skills in persuasion and decision making.
- Skills in using computers and data processing.

TRAINING

- The minimum educational requirement is a bachelors degree in journalism including studies of liberal arts to get a broad base of knowledge.
- A person usually begins in a lower level related occupation to get experience before being considered for an editing position.
- Advanced degrees in journalism are available.
- Training in some specialty occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

193	Journalism and Communications
441	English
448	Liberal Arts and Sciences
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, grammar, literature, journalism, history, government, economics, sociology, psychology, media production, data processing, commercial and graphic art, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 79-80.
Guide for Occupational Exploration (2nd ed., 1984), pp. 81-83 and 554-557.
Occupational Outlook Handbook (1990-91 ed.), p. 173.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3313 REPORTERS

OCCUPATIONAL DESCRIPTION

Reporters gather and analyze information about events for communication to the public. They may prepare news stories for publication in a newspaper or for broad-casting on radio or television. Many reporters specialize in particular subject areas such as sports, politics, foreign affairs, fashion, or religion. Some write critical reviews of books, music, or plays. Others present news over radio or television. Some prepare ads, take photographs, or write editorials. DOT 131.267-018

HOLLAND CODE

EAS (Enterprising, Artistic, Social)

SPECIALTIES

Columnists/Commentators (131.067-010)
Copy Writers (131.067-014)
Critics (131.067-018)
Editorial Writers (131.067-022)
Newscasters (131.267-010)
Newswriters (131.267-014)
Military Reporters and Newswriters (M33130)

NCIS RELATED OCCUPATIONS

3210	Authors
3312	Editors
3320	Public Relations Specialists
3330	Radio and Television Announcers
3980	Technical Writers
4642	Interviewing Clerks

WORK ACTIVITIES

- Get assignments to develop story ideas or ad copy.
- Gather information from interviews, public records, events, surveys, research, and other data.
- Verify information.
- Write draft of copy or story and send to superior for approval.
- Change copy as needed.
- Give taped or live reports from site of event.
- Use machines like tape recorders, cameras, and computers.
- Develop leads for new stories or copy.

APTITUDES

- Be able to learn techniques of journalism and reporting and a variety of subject areas.
- Have a very good ability to read, write, and speak.
- Be able to work with people and influence their opinions.
- Be able to interpret people's needs.
- Have good space and form perception and physical coordination.
- Be creative and imaginative and have initiative.
- Be able to work under pressure.

WORK SETTING

Environment

Work indoors in offices and newsrooms and on sets and outdoors on assignments.

Hours

Work 40 hours a week with overtime possible; evening shifts are possible.

Employers

Advertising agencies, large manufacturing firms, newspapers, magazines, radio and television stations, and businesses.

CONSIDERATIONS

- Job may be considered prestigious.
- Reporters may have to start at a low level position or a small station or paper before moving on to more prestigious positions.
- Work may include pressure to meet deadlines or clients' demands.

NEBRASKA EMPLOYMENT

About 567 reporters are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for reporters with a bachelors degree range between $10,400 and $14,500 a year depending on the experience and the size and geographic location of the employer. Nationally, salaries span a much broader range of between $11,000 and $30,000 a year. Most reporters receive benefits such as paid vacations, group insurance, and pension plans.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors

- Growth will be the result of the increase of suburban and small town newspapers.
- Writers who can handle scientific or technical subjects will be at an advantage.
- Competition for jobs on large metropolitan newspapers and national magazines will be keen.
- College teaching opportunities are expected to be good because of increased enrollments in journalism.

PREPARATION

SKILLS

- Knowledge of newswriting, publishing, advertising, and copy writing techniques.
- Skills in interviewing, writing, researching, using correct grammar, and spelling.
- Knowledge of significant issues and interests of readers.
- Skills in working with others.
- Skills in typing and data processing.

TRAINING

- The minimum educational requirement is usually a bachelors degree in journalism or related field.
- Courses in English, sociology, psychology, and political science are helpful.
- Previous work experience on high school or college papers, church newsletters, or other publications are helpful.
- The Newspaper Fund and individual newspapers offer internships to help students gain experience.
- Graduate degrees are required to teach at colleges and universities.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
441	English

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition/grammar, literature, journalism, sociology, psychology, government, media production, typing, data processing, drama, geography, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 77-78.
Guide for Occupational Exploration (2nd ed., 1984), pp. 81-83.
Occupational Outlook Handbook (1990-91 ed.), p. 171.
Military Career Guide (1988-89 ed.), p. 58.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21819	University of Nebraska Medical Center
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

3320 PUBLIC RELATIONS SPECIALISTS

OCCUPATIONAL DESCRIPTION

Public relations specialists develop and maintain the public image of the individuals, groups, or organizations they represent. Some handle press or consumer relations or conduct political or fund raising campaigns. Some represent an interest group and promote a policy on a public issue. Some may recruit works or prepare releases and ads for newspapers, radio, and television. They may make speeches and conduct sales campaigns.

HOLLAND CODE

ESA (Enterprising, Social, Artistic)

SPECIALTIES

Lobbyists (165.017-010)
Public-Relations Representatives (165.067-010)
Sales-Service Promoters (165.167-010)
Military Public Information Officers (M33200)

NCIS RELATED OCCUPATIONS

1250	Marketing and Advertising Managers
1430	Personnel Specialists
3240	Actors and Directors
32402	Television Directors
32403	Producers
32404	Program Directors
3312	Editors
3313	Reporters
3330	Radio and Television Announcers
4153	Advertising Sales Representatives
4450	Demonstrators, Promoters, and Models

WORK ACTIVITIES

- Write and edit news releases, newsletters, reports, and articles.
- Contact communications media to release information.
- Plan production of pamphlets, information sheets, films, tapes, and video presentations and supervise their use.
- Arrange convention exhibits, news conferences, tours, special events, and contests.
- Help maintain relations with employees, consumers, educational institutions, professional ganizations, investors, government agencies, communities, and other audiences.
- Gather data through research, surveys, opinion polls, and interview.
- Counsel management.

APTITUDES

- Be able to learn principles of public relations.
- Be able to work with people and influence them.
- Have strong abilities in reading, writing, and public speaking.
- Be able to move often from one task to another using several different skills.
- Be able to handle detailed paperwork, plan projects, and use numbers.
- Be creative, self-confident, and enthusiastic.
- Be able to make decisions based on observations and applications.
- Be able to work under pressure.

WORK SETTING

Environment

Work indoors, public meeting rooms, legislative halls, and at social gatherings; travel may be required.

Hours

Work 40 hours a week with frequent overtime; irregular hours may include evenings and weekends.

Employers

Self-employed, national organizations, government agencies, business and industrial firms, educational institutions, health and social service organizations, labor unions, financial institutions, insurance companies, advertising and public relations firms, public utilities, and stores.

CONSIDERATIONS

- Job may be prestigious.
- Job involves hard work, long and irregular hours, and pressure to meet deadlines and satisfy clients.

NEBRASKA EMPLOYMENT

About 1,124 public relations workers are projected to be employed by 1991.

WAGES

Entry level salaries for public relations specialists vary according to the amount of education completed combined with public relations experience as well as the geographic location of the employer. In Nebraska, starting salaries span a range of $14,768 to $25,752 a year. Nationally salaries span a more expansive range of $10,000 to $30,000 a year. In the Federal Government, persons with a bachelors degree generally start at $20,000 a year; those with a masters degree generally start at $24,500 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Favorable
Factors

- Growth is expected to occur as businesses and organizations add public relations specialists.
- Changes in the economy can affect employment in this area.
- Because this work seems glamorous and exciting, it attracts large numbers of people.
- Prospects are best for people with good academic preparations, media experience, and proven writing skills.

PREPARATION

SKILLS

- Knowledge of administration, public speaking, and the news media.
- Knowledge of the company, group, or individual represented.
- Skills in written and oral communication.
- Skills in information gathering, organizing, and planning.
- Skills in editing, paste-up, and layout for publications.
- Skills in coordinating many people to get a job done.
- Skills in dealing with the public and persuading others.
- Skills in decision making.

LICENSING OR CERTIFICATION

- Though it is not required for employment, a person can be accredited by the Public Relations Society of America.
- To be accredited, a person must work in the field for at least five years and pass a six-hour spoken and written exam.
- Some states require lobbyists to register with government authorities to work with legislative lobbying.

TRAINING

- Most employers require a college degree combined with public relations experience.
- A bachelors degree is necessary for most entry-level jobs.
- Many companies have on-the-job training programs in public relations.
- Previous work experience in business, communications, or journalism will be helpful.
- College students may participate in summer work programs in public relations or join the Public Relations Student Society of America.

EDUCATIONAL PROGRAM

145	Business Administration & Management
146	Marketing
193	Journalism and Communications
443	Speech Communications
586	Political Science
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition/grammar, speech, journalism, sociology, psychology, media production, marketing, commercial and graphic art, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 97.
Guide for Occupational Exploration (2nd ed., 1984), pp. 558-560.
Occupational Outlook Handbook (1990-91 ed.), p. 168.
Military Career Guide (1988-89 ed.), p. 275.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary

21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
22601	Nebraska Indian Community College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
22517	York College

3330 RADIO AND TELEVISION ANNOUNCERS

OCCUPATIONAL DESCRIPTION

Radio and television announcers provide information and entertainment to audiences over the airwaves. They may read news, weather, commercials, sports, or station announcements. Radio broadcasters handle a variety of assignments including announcing, playing music, reading, writing and producing commercials, logging meter readings, and signing the station log. Television broadcasters perform no technical duties when on the air other than talking. Some announcers may specialize in one area such a sports, news, or weather. DOT 159.147-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Disk Jockeys (159.147-014)
Announcers (159-347-010)
Military Radio and Television Announcers (M33300)

NCIS RELATED OCCUPATIONS

1341	Communications Operations Managers
3230	Musicians and Composers
32301	Instrumental Musicians
32302	Singers
3240	Actors and Directors
32401	Actors
32402	Television Directors
32403	Producers
32404	Program Directors
3312	Editors
3313	Reporters
3320	Public Relations Specialists

WORK ACTIVITIES

- Identify station, introduce and close shows, and announce station breaks, commercials, or public service information.
- Read news and weather bulletins and sports information.
- Make and play musical selections and comment on selection.
- Operate control consoles and radio transmitters and keep daily program log.
- Describe public events, interview guests, or give running commentary on live sports events.
- May sell time or write advertisements.
- Work as public-address announcer and master of ceremonies.

APTITUDES

- Be able to learn the basics of broadcasting and announcing.
- Have good use of words to present information and ideas clearly.
- Be able to perform a variety of tasks in a limited time.
- Be able to do simple math, keep accurate records, and ad lib.
- Be friendly, self-confident, able to talk easily and pleasantly, and able to relate to people.
- Have good judgment and the ability to react quickly in emergencies.

WORK SETTING

Environment

Work indoors in radio or television studios and control rooms or sports booths.

Hours

Work 35 to 40 hours a week with possible overtime; may have split and rotating shifts with evening, weekend, holiday, and night time hours.

Employers

Commercial and noncommercial radio and television stations, cable systems, program production studios, and sporting and entertainment organizations.

CONSIDERATIONS

- Announcers must have a pleasant voice.
- Job may be considered prestigious.
- Work schedules are often irregular.
- This may be a good job for disabled workers since very little physical activity is required.

NEBRASKA EMPLOYMENT

About 696 radio and television announcers are projected to be employed by 1991.

WAGES

Announcers generally get their first broadcasting job in a small station. Entry level salaries will reflect the type of station, the size of the market it serves, and the qualifications of the announcer. In Nebraska, starting salaries for all announcers span a range of $13,520 to $27,872 a year. Nationally, entry level salaries parallel those in Nebraska. For both radio and television salaries are highest in the larger markets.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- Jobs are created as new radio and television stations are licensed and as more cable systems do their own programming.
- The use of automated programming equipment in radio has reduced the number of openings.
- There is a surplus of applicants particularly in television.
- Radio stations are more likely to hire beginners than are television stations.

PREPARATION

SKILLS

- Knowledge of broadcasting equipment, federal regulations, and voice and microphone techniques.
- Knowledge of phonics, grammar, usage, and pronunciation.
- Skills in research, writing, and typing.
- Knowledge of specific field or type of music.
- Skills in interviewing and relating to people.
- Skills in speaking without a script.

LICENSING OR CERTIFICATION

- Many radio stations require their announcers to obtain a Federal Communications Commission radiotelephone operator's license which allows them to operate a radio transmitter.

TRAINING

- The minimum educational requirement is a high school diploma.
- Job chances are best for those who have special training in broadcasting.
- Formal training is available at many colleges and private broadcasting schools.
- Station officials pay special attention to taped auditions which have samples of a person's style at announcing commercials, news, interviews, and music.
- Previous part-time work in a radio station during high school or college may be helpful.

EDUCATIONAL PROGRAM

193	Journalism and Communications
196	Communications Technology
316	Dramatic Arts
443	Speech Communication

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include composition/grammar, speech, journalism, drama, media production, music, and electronics.

BIBIOLOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 89-90.
Guide for Occupational Exploration (2nd ed. 1984), pp. 90-93.
Occupational Outlook Handbook (1990-91 ed.), pp. 169.

SCHOOLS

22501	Central Community College-Hastings
22307	Central Community College-Platte
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3401 ATHLETES AND RELATED WORKERS

OCCUPATIONAL DESCRIPTION

Athletes and related workers are involved in sports and athletics. Some work as coaches, trainers, or scouts. Some manage business affairs for athletes. Some officiate at sports events as umpires, timers, judges, starters, or scorers. Others direct activities at sports events. Some compete in the sports.

HOLLAND CODE

ESR (Enterprising, Social, Realistic)

SPECIALTIES

Head Coaches (153.117-010)
Athlete Managers (153.117-014)
Professional Sports Scouts (153.117-018)
Racetrack Stewards (153.117-022)
Pit Stewards (153.167-014)
Racing Secretaries and Handicappers (153.167-018)
Athletic Trainers (153.224-010) (34011)
Racehorse Trainers (153.224-014)
Automobile Racers (153.243-010)
Motorcycle Racers (153.243-014)
Jockeys (153.244-010)
Umpires (153.267-018)
Professional Athletes (153.341-010) (34012)
Scorers (153.387-014)
Horse Exercisers (153.674-010)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
2033	Recreation Workers
2320	Elementary School Teachers
2330	Secondary School Teachers
3033	Physical Therapists
5624	Animal Caretakers

WORK ACTIVITIES

- Plan and direct training and recommend acquisition of players for professional athletic teams.
- Negotiate with promoters to settle contracts and business matters for professional athletes.
- Evaluate athletic skills of athletes to determine potential for professional sports.
- Coordinate and direct activities at racetracks.
- Train horses for racing.
- Officiate at sporting events.
- Ride race horses to exercise and condition them for racing.

APTITUDES

- Be able to learn the rules and techniques of a particular sport.
- Be able to communicate with and influence others.
- Be able to make decisions based on data, experience, and intuition.
- Be able to plan and coordinate activities and direct other workers.
- Be able to make decisions quickly and work under pressure.
- Be self-confident and have good judgment.

WORK SETTING

Environment

Work indoors in offices, locker rooms, training rooms, and athletic facilities and outdoors at racing facilities; frequent travel required.

Hours

Work 40 hours a week with frequent overtime; holiday, weekend, and evening hours are frequently required.

Employers

Educational institutions, professional sports teams, sports medicine clinics, athletic clubs, athletic tournament organizations, athletic facilities, racing facilities, and organizations, and self-employed.

CONSIDERATIONS

- Most of these jobs are considered prestigious.
- There is a great deal of pressure and travel associated with most of these jobs.
- Retirement often comes at an early age.

NEBRASKA EMPLOYMENT

About 1,178 athletes and related workers are projected to be employed by 1991.

WAGES

Salaries will vary according to the specialty in which the worker is employed as well as the talent, skill, and the professional reputation of the worker. In Nebraska, entry level salaries span a broad range of $10,000 to $22,000 a year. National salaries vary considerably reflecting the diversity of specialties within this group of occupations.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Unfavorable
Factors
- Competition for positions is very strong.
- Athletes and related workers frequently work in related jobs.
- Only the most talented are chosen.

PREPARATION

SKILLS

- Knowledge of the techniques and rules of individual sports.
- Skills in planning, organizing, and directing activities and other workers.
- Skills in negotiation and persuasion.
- Skills in decision making.
- Skills in officiating.
- Knowledge of human anatomy and physiology.
- Knowledge of automobiles, motorcycles, or race horses.

LICENSING OR CERTIFICATION

- Horse racing workers must be licensed by the Nebraska Racing Commission.
- Most of the licenses are issued after the applicant has secured an employer and has met the requirements of employment.

TRAINING

- Training requirements vary depending upon the specialty.

EDUCATIONAL PROGRAM

235	Teacher Education, Specific Subject Areas
367	Rehabilitation Services
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Subjects vary with the occupational specialties.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 87-89.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11903	Emporia State University
21808	Grace College of the Bible
21509	Hastings College
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

34011 ATHLETIC TRAINERS

OCCUPATIONAL DESCRIPTION

Athletic trainers evaluate physical condition and advise and treat athletes to maintain the maximum physical fitness needed to take part in athletic competition. Their responsibilities are to prevent injuries through medical screening and sound conditioning programs, to provide immediate first aid, and to carry out rehabilitation for injured athletes as prescribed by a physician. DOT 153.224-010

HOLLAND CODE

SRE (Social, Realistic, Enterprising)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
2033	Recreation Workers
2320	Elementary School Teachers
2330	Secondary School Teachers
3033	Physical Therapists
3401	Athletes and Related Workers
34012	Professional Athletes

WORK ACTIVITIES

- Recommend exercises to strengthen muscles.
- Advise coaching staff about physical conditioning programs.
- Teach athletes and coaches about nutrition.
- Apply strappings to joints to prevent strains and sprains.
- Choose and fit protective equipment including mouth guards, face masks, helmets, gloves, and shoes.
- Give first aid to injured athletes.
- Evaluate injuries and refer athletes to medical professionals.
- Treat injuries under a doctor's supervision.

APTITUDES

- Be able to learn and understand the various parts of the body and the principles and techniques of athletic training.
- Have very good ability to communicate and work with people.
- Have good space and form perception, physical coordination, and hand and finger dexterity.
- Be able to motivate people.
- Have good judgment and ability to work under stress in emergencies.
- Be able to make decisions based on data, practical applications, and experience.
- Be creative, self-confident, and mature.

WORK SETTING

Environment

Work indoors in locker rooms, offices, training rooms, and gymnasiums and outdoors on athletic fields.

Hours

Work 50 to 60 hours a week with many evening and weekend hours.

Employers

Educational institutions, professional sports teams, sports medicine clinics, athletic clubs, athletic tournament organizations, and physical therapy departments.

CONSIDERATIONS

- Job opportunities are equally good for both men and women.
- Worker must be interested in sports.

NEBRASKA EMPLOYMENT

About 20 athletic trainers are projected to be employed by 1991.

WAGES

Entry level salaries for licensed athletic trainers with a bachelors degree vary according to the nature of employment. Starting salaries in Nebraska parallel the national average starting salary range of $10,000 to $21,000 a year for all athletic trainers.

EMPLOYMENT GROWTH

Nebraska

Somewhat Favorable

National

Somewhat Favorable

Factors

- Expanding college, university, and high school athletic programs may create a need for more athletic trainers.

- Trainers who are certified and also registered physical therapists will have the best job opportunities.
- Many trainers work in related jobs such as teachers and/or coaches.

PREPARATION

SKILLS

- Knowledge of science, human anatomy and physiology, athletic training methods, and first aid.
- Skills in organizing programs and advising others.
- Skills in evaluation and decision making.

LICENSING OR CERTIFICATION

- Athletic trainers must be licensed by the Nebraska Board of Examiners in Athletic Training.
- To be licensed, a person must be at least 21, have completed a college curriculum in athletic training and pass the exam or completed four years of college plus two years as a student athletic trainer and pass the exam. Certification by the National Athletic Trainers Association may also be required.
- To be certified by the National Athletic Trainers Association, a person must have a degree from an accredited college or university, finish certain course and work requirements, and pass the national exam given by the certification board.

TRAINING

- The minimum educational requirement is a bachelors degree in physical education, athletic training, or physical therapy.
- An advanced degree is necessary to teach athletic training in a college or university.

EDUCATIONAL PROGRAM

235	Teacher Education, Specific Subject Areas
367	Rehabilitation Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in biology, chemistry, anatomy, physical education, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 87.

Guide for Occupational Exploration (2nd ed., 1984), pp. 513-517.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
11902	Colorado State University
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11903	Emporia State University
21509	Hastings College
11941	Hutchinson Community College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11920	University of Iowa
11937	University of Missouri-Kansas City
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

34012 PROFESSIONAL ATHLETES

OCCUPATIONAL DESCRIPTION

Professional athletes are paid for competing in athletic events to entertain an audience. They participate in professional competitive athletic events such as football, boxing, tennis, golf, and hockey. They exercise and practice under the direction of a coach or athletic trainer to develop the precise timing and athletic skills necessary to be successful. DOT 153.341-010

HOLLAND CODE

SRC (Social, Realistic, Conventional)

SPECIALTIES

Automobile Racers (153.243-010)
Motorcycle Racers (153.243-014)
Jockeys (153.244-010)

NCIS RELATED OCCUPATIONS

1352	Recreation and Entertainment Managers
2330	Secondary School Teachers
3401	Athletes and Related Workers
34011	Athletic Trainers

WORK ACTIVITIES

- Exercise and practice under direction of coach.
- Take part in sport following given rules.

APTITUDES

- Be able to learn the rules and techniques of the particular sport played.
- Be able to relate well to and communicate with people.
- Have good space and form perception, physical coordination, eye-hand coordination, and hand and finger dexterity.
- Be able to think quickly and make accurate decisions based on knowledge and experience.
- Be able to work under stress and within set time and distance limits.

WORK SETTING

Environment
Setting depends on type of sport; frequent travel is required.

Hours
Work long and irregular hours depending on sport; weekend, evening, and holiday hours are usually required.

Employers
Professional teams in baseball, football, hockey, soccer, and basketball; self-employed as tennis players, golfers, boxers, skaters, bowlers, or track athletes.

CONSIDERATIONS

- Competitive people with athletic skill will find this career rewarding and offering prestige.
- Retirement often comes at an early age and athletes face possible hazards and injuries.
- The frequent traveling may affect personal and family life.
- Athletes often have the chance for extra income through related occupations both during and after their playing career.

NEBRASKA EMPLOYMENT

Few professional athletes are employed.

WAGES

Starting salaries for professional athletes vary according to the demonstrated talent and skill of the individual athlete as well as the type of sport in which they compete.

EMPLOYMENT GROWTH

Nebraska
Unfavorable
National
Unfavorable
Factors

- Competition for positions is very strong and only the most talented athletes will be chosen.
- There are more professional sports teams than before.
- Athletes may find related jobs.

PREPARATION

SKILLS

- Knowledge of the techniques and rules of the athlete's individual sport.

- Skills in planning and understanding strategy.
- Skills in working with other people.
- Natural athletic ability.

LICENSING OR CERTIFICATION

- Though licensing is not required, some athlete's must join a professional association to become recognized and make top earnings in their sport.

TRAINING

- Education requirements differ with various sports.
- Most training in the chosen sport comes during childhood and teen years.
- Skills are developed by taking private lessons, playing for high school or college teams, or competing in other nonprofessional activities.
- Taking part in the chosen sport in college may be helpful.
- Professional athletes spend hours in training and practice to continue improving the skills of their sport.

EDUCATIONAL PROGRAM

235 Teacher Education, Specific Subject Areas

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in health and physical education.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 88.
Guide for Occupational Exploration (2nd ed., 1984), pp. 576-579.

SCHOOLS

21801	Bellevue College
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3620 CLINICAL LABORATORY TECHNOLOGISTS

OCCUPATIONAL DESCRIPTION

Clinical laboratory technologists perform various laboratory tests to help doctors detect, diagnose, and treat disease and infection. They use microscopes, chemicals, and precise instruments to run tests on blood, tissues, and fluids from the human body. In small labs they often perform many types of tests. In large labs, they usually specialize in one area. Most of these workers conduct tests related to patient treatment; however, some do research, develop lab techniques, teach, or head lab programs.

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Teaching Supervisor Medical Technologists (078.121-010)
Chief Medical Technologists (078.161-010)
Chemistry Technologists (078.261-010)
Microbiology Technologists (078.261-014)
Cytotechnologists (078.281-010)
Medical Technologists (078.361-014)
Tissue Technologists (078.361-030)
Ultrasound Technologists (078.364-010)

NCIS RELATED OCCUPATIONS

1845	Chemists
1854	Biological Scientists
18541	Biochemists
18542	Biologists
18544	Microbiologists
1855	Medical Scientists
3690	Health Technologists and Technicians
36903	Medical-Laboratory Technicians
3820	Biological Technologists and Technicians
3831	Chemical Technologists and Technicians
3890	Science Technologists

WORK ACTIVITIES

- Collect clinical samples.
- Prepare specimens for microscopic examination.
- Conduct and analyze tests on body fluids and tissues.
- Prepare reports of their findings for physicians or pathologists who ordered the reports.
- Prepare laboratory solutions and calibrate instruments and equipment.
- Prepare vaccines and serums.
- Cultivate, identify, and analyze bacteria.
- Use mechanical and electronic laboratory equipment.

APTITUDES

- Be able to learn the principles and methods of medical laboratory technology.
- Have ability with words and numbers to do tests, understand technical literature, and talk with other personnel.
- Have good space and form perception and ability to see differences in color.
- Be able to make decisions based on data, handle a variety of duties, and work with exact standards.
- Have good hand and finger dexterity and physical coordination.
- Have ability to do precise work accurately.

WORK SETTING

Environment
Work indoors in laboratories.
Hours
Usually work 40 hours a week; in hospitals schedules may include evening, weekend, and holiday hours.
Employers
Hospitals, clinics, medical research laboratories, colleges and universities, physicians' offices, veterinary laboratories, industrial laboratories, medical schools, health maintenance organizations, and government agencies.

CONSIDERATIONS

- Job gives chance to take part in diagnosis and treatment of serious illness.
- Work may include pressure of time limits and accuracy because errors could cause a wrong diagnosis.
- Workers may be exposed to unpleasant odors and to diseased patients and specimens.

NEBRASKA EMPLOYMENT

About 977 medical/clinical laboratory technologists are projected to be employed by 1991.

WAGES

Starting salaries for clinical laboratory technologists vary according to the size and location of the employer as well as the college record of the technician. Entry level wages in Nebraska range between $16,000 to $21,000 a year. National salary figures parallel those of Nebraska. The highest salaries will be found in major metropolitan areas.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors
- Demand is expected to expand as physicians increasingly use laboratory tests to diagnose and treat diseases as the population ages.
- Job growth may slow as a result of the pressure to contain health care costs.
- Competition will be greatest in larger cities with more job opportunities in small towns and rural areas.

PREPARATION

SKILLS

- Knowledge of basic anatomy and physiology, biology, chemistry, and the basics of medical laboratory technology.
- Skills in performing lab analyses and using testing instruments.
- Skills in diagnosis, problem solving, and decision making.
- Skills in writing, reading, and speaking.
- Skills in accurate reporting and working within set standards.

LICENSING OR CERTIFICATION

- Licensing is not required but to gain professional status, a person may be certified by the Board of Registry of the American Society of Clinical Pathologists (ASCP) or the American Registry of Diagnostic Medical Sonographers.

TRAINING

- The minimum educational requirement for technologists is usually a bachelors degree with training in medical technology and laboratory experience.
- Advanced degrees are necessary for those choosing specialization, teaching, administration, or research.
- Technicians acquire their training at community colleges, hospitals, vocational and technical schools, or in apprenticeship programs.

EDUCATIONAL PROGRAM

366	Allied Health Services
383	Medical Laboratory Technologies
385	Diagnostic and Treatment Services
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in biology, chemistry, physics, anatomy, health, health occupations, and typing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 61-62.
Guide for Occupational Exploration (2nd ed., 1984), pp. 127-132.
Occupational Outlook Handbook (1990-91 ed.), p. 187.

SCHOOLS

49802	Bergan Mercy School of Radiologic Technology
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21606	Dana College
21507	Doane College
49818	Immanuel Medical Center School of Radiologic Technology
11943	Kansas Newman College
21311	Kearney State College
11961	Laboure College
11945	Lakewood Community College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College

49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
11920	University of Iowa
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3630 DENTAL HYGIENISTS

OCCUPATIONAL DESCRIPTION

Dental hygienists work with dentists as part of a dental health team. They help people prevent tooth decay and gum disease and maintain oral health. Dental hygienists examine teeth and gums, clean teeth, and treat teeth with decay preventative agents. They take impressions of teeth, remove sutures, and give local anesthetics. They also take and develop x-rays. Some instruct patients in dental health and provide dental health education for school children and other members of the community. DOT 078.361-010

HOLLAND CODE

SAI (Social, Artistic, Investigative)

SPECIALTIES

Military Dental Specialists (M36300)

NCIS RELATED OCCUPATIONS

2620	Dentists
5232	Dental Assistants
6865	Dental Laboratory Technicians

WORK ACTIVITIES

- Examine and chart conditions of mouth.
- Clean and polish teeth and massage gums.
- Take x-rays and expose and develop those x-rays.
- Apply minor treatments to unhealthy gum tissue as directed by dentist.
- Prepare dental solutions.
- Discuss with patients the use of cleaning devices, oral hygiene, and proper diet.
- Lecture groups about proper oral hygiene or provide dental health education to schools.
- Make impressions for casts, give local anesthetic, or place and remove temporary pieces.

APTITUDES

- Be able to learn the techniques and sciences related to dental hygiene.
- Have verbal ability to instruct others.
- Have good hand and finger dexterity, space and form perception, and eye-hand coordination.
- Be able to relate to a variety of people who may be tense and nervous.
- Be able to do precise work.
- Be patient and tactful.

WORK SETTING

Environment
  Work indoors in dental offices and laboratories.
Hours
  Work 35 to 40 hours a week with some part-time positions available.
Employers
  Dentists, public health agencies, clinics, schools, nursing homes, hospitals, government agencies, and institutions such as correctional institutions.

CONSIDERATIONS

- Job offers satisfaction from contributing to the health and well-being of people.
- Workers may be exposed to communicable diseases.

NEBRASKA EMPLOYMENT

About 488 dental hygienists are projected to be employed by 1991.

WAGES

Starting salaries for licensed dental hygienists employed full time in Nebraska span a range from $17,000 to $25,000 a year. Nationally, the entry level salary range is somewhat lower reflecting the majority of dental hygienists who are employed on a part-time basis. Salaries range from $13,900 to $20,000 a year nationally.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors
- There is a shortage of hygienists in rural areas.
- Demand for dental care is expected to increase because of population growth, rising real incomes, growing awareness of

the importance of oral health, and availability of dental insurance.

- The growing supply of dentists may limit the demand for dental hygienists as dentists choose to do tasks they might otherwise delegate to hygienists.

PREPARATION

SKILLS

- Knowledge of dental procedures, equipment, and techniques of instructing others in dental hygiene.
- Skills in recordkeeping and performing laboratory work.
- Skills in dealing with people and working closely with others.
- Skills in communication.

LICENSING OR CERTIFICATION

- Dental hygienists must be licensed by the Nebraska Board of Examiners in Dentistry.
- To be licensed a person must be 18 years of age, have a high school diploma, graduate from an approved training program, and pass the exams.
- Thirty hours of continuing education are required biennially.

TRAINING

- The minimum educational requirement is a two-year associate degree or a bachelors degree in dental hygiene.

EDUCATIONAL PROGRAM

358 Dental Services

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in speech, advanced math, biology, chemistry, psychology, sociology, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 61.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-518.
Occupational Outlook Handbook (1990-91 ed.), p. 189.
Military Career Guide (1988-89 ed.), p. 62.

SCHOOLS

22501	Central Community College-Hastings Campus
21102	Chadron State College
21606	Dana College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
49823	Omaha College of Health Careers
21715	Peru State College
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln

3640 HEALTH RECORD TECHNICIANS

OCCUPATIONAL DESCRIPTION

Health record technicians maintain medical records of patients in a hospital, clinic, or doctors office. A medical record is a permanent report of a patient's condition and treatment. They copy medical data onto forms, analyze and code information, compile statistics, and keep files of records. They also find medical information for doctors and others upon request. Some plan new ways to keep health records up to date. DOT 079.367-014

HOLLAND CODE

CSE (Conventional, Social, Enterprising)

SPECIALTIES

Military Medical Record Technicians (M36400)

NCIS RELATED OCCUPATIONS

1310	Medicine and Health Managers
4622	Secretaries
4694	Library Clerks

WORK ACTIVITIES

- Review medical records for completeness and accuracy.
- Code diseases, operations, diagnoses, and treatment.
- Gather medical care and census data for statistical reports.
- Transcribe medical reports and file patients' records.
- Get information from records when needed by legal, government, or insurance personnel.
- Give information to hospital staff for patient care evaluation.
- Keep indexes on patient, disease, operation, tumor registries, and other categories.

APTITUDES

- Be able to learn medical terms and methods of processing medical records.
- Have good ability with words and numbers.
- Have a good memory and space and form perception.
- Be able to record information accurately, make decisions based on written information, and work within set standards.
- Enjoy detailed work and be well organized.

WORK SETTING

Environment
  Work indoors in offices

Hours
  Work 40 hours a week; schedule may include weekend, evening or holiday hours; part-time jobs may be available.

Employers
  Hospitals, clinics, research centers, nursing homes, government agenices, insurance companies, computer firms, health maintenance organizations, pharmaceutical firms, and lawyers.

CONSIDERATIONS

- Some of the tasks to be completed are very repetitive.
- Job may include committee work on special projects.

NEBRASKA EMPLOYMENT

About 630 health record technicians are projected to be employed by 1991.

WAGES

Entry level salaries for health record technicians vary according to the size and geographic location of the employer as well as the amount of training completed by the technician. In Nebraska, starting wages range between $12,896 and $16,100 a year. Nationally, salaries compare favorably with Nebraska with a somewhat higher upper range of $20,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable

National
  Favorable

Factors

- The increasing use of health insurance, Medicare, and Medicaid and attempts to contain health care costs will require more complete records causing a need for these workers.

- The outlook is best for those with an associate degree and specialized training in computer recordkeeping.

PREPARATION

SKILLS

- Knowledge of health records, information storage systems, medical terms, and classification systems.
- Skills in typing, filing, and transcribing.
- Skills in reporting statistical information and gathering information.
- Skills in paying attention to detail and accuracy.
- Knowledge of government regulations.

LICENSING OR CERTIFICATION

- Accreditation is not required but can bring promotions and better pay.
- To become an Accredited Record Technician (ART), a person must complete an accredited training program and pass an exam.

TRAINING

- Most employers prefer those who have completed a two-year associate degree program accredited by the American Medical Association and the American Medical Record Association.
- Training in computer recordkeeping is helpful.

EDUCATIONAL PROGRAM

158	Secretarial Programs
162	Health Services Administration
163	Medical Records Technology
366	Allied Medical Services

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, biology, chemistry, health, health occupations, typing, office education, and data processing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 65.
Guide for Occupational Exploration (2nd ed., 1984), pp. 463-469.
Occupational Outlook Handbook (1990-91 ed.), p. 201.
Military Career Guide (1988-89 ed.), p. 64.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21504	Concordia College
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
99817	Institute of Computer Science
21311	Kearney State College
11945	Lakewood Community College
22718	Lincoln School of Commerce
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
44802	Nebraska College of Business
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
44805	Word Processing and Secretarial College
22517	York College

3650 RADIOLOGIC TECHNOLOGISTS

OCCUPATIONAL DESCRIPTION

Radiologic technologists take x-ray pictures to help doctors diagnose and treat injuries and diseases. They also give radiation treatments to cancer patients as prescribed by a doctor. Sometimes they prepare radioactive solutions for patients to swallow or have injected. They then use special cameras to find areas in the body organs that have a certain reaction to the solution. They also prepare and keep treatment records and prepare work schedules for assistants. DOT 078.362-026

HOLLAND CODE

IRS (Investigative, Realistic, Social)

SPECIALTIES

Chief Radiologic Technologists (078.162-010)
Nuclear Medical Technologists (078.361-018)
Radiation-Therapy Technologists (078.361-034)
Military Radiologic Technicians (M36500)

NCIS RELATED OCCUPATIONS

3620	Clinical Laboratory Technologists
3630	Dental Hygienists

WORK ACTIVITIES

- Prepare and place patients for x-ray examination.
- Set x-ray machine and expose film.
- Prepare opaque solution and administer internally to patients.
- Prepare and place patients behind fluroscopic machine.
- Prepare radioactive solutions and administer to or inject into patients.
- Expose an area of patients' bodies to the proper concentration of radiation for set periods of time.
- Scan parts of the patients to determine the presence of disease using high frequency sound waves.
- Work under the supervision of radiologists.

APTITUDES

- Be able to learn the principles and techniques of radiologic technology.
- Have good verbal and math abilities.
- Have good eye-hand coordination, finger and hand dexterity, space and form perception, and ability to see differences in objects.
- Be able to handle a variety of activities, keep accurate records, make judgments based on data, and work within precise standards of measurement.
- Be able to work with a variety of people.

WORK SETTING

Environment

Work indoors in hospitals, treatment rooms, and offices.

Hours

Work 40 hours a week; may include weekend, evening, and holiday hours; some part-time positions may be available.

Employers

Hospitals, colleges and universities, clinics, health maintenance organizations, and private physicians.

CONSIDERATIONS

- Job may offer satisfaction through involvment in the medical process and medical treatment of patients.
- Workers may be exposed to radioactive materials although safety measures are taken.

NEBRASKA EMPLOYMENT

About 339 radiologic technologists are projected to be employed by 1991.

WAGES

Entry level salaries for radiologic technologists vary according to the size and geographic location as well as the type of employer and the amount of education completed by the technologist. In Nebraska, the starting salary for radiologic technologists with two years training and no specialization is approximately $17,400 a year. Specialists in nuclear medicine and ultrasound start at approximately $25,000 a year. Nationally, the starting range for all radiologic technologists is between $17,000 and $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Growth will be greatest in jobs in doctor's offices, health maintenance organizations, radiology clinics, and other outpatient settings.
- Outlook is best in specialty areas such as radiation therapy, nuclear medicine and ultrasound.
- Opportunities are greater in rural areas and small towns than in large cities.

PREPARATION

SKILLS

- Knowledge of anatomy and physiology, techniques of radiologic technology, radiation protection and safety, medical terms, math, physics and computers.
- Skills in dealing with a variety of people.
- Skills in communication.
- Skills in recordkeeping and decision making.

LICENSING OR CERTIFICATION

- Licensing is not required in Nebraska but to receive professional status, a technologist must be registered by the American Registry of Radiologic Technologists.
- To be registered, a person must graduate from a program approved by the American Medical Association and pass an exam.
- Registered technologists may become certified in radiation therapy, or nuclear medicine by completing an additional year of study.

TRAINING

- Completion of a formal training program offered by a hospital, medical school, college, or university is required.
- Graduates from programs approved by the American Medical Association usually find better job opportunities.

EDUCATIONAL PROGRAM

353	Nursing
383	Medical Laboratory Technologies
385	Diagnostic and Treatment Services
386	Respiratory Therapy

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in algebra, biology, chemistry, physics, anatomy, psychology, health, typing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 61-62.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-518.
Occupational Outlook Handbook (1990-91 ed.), p. 205.
Military Career Guide (1988-89 ed.), p. 74.

SCHOOLS

21801	Bellevue College
49802	Bergan Mercy School of Radiologic Technology
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
49818	Immanuel Medical Center School of Radiologic Technology
11943	Kansas Newman College
21311	Kearney State College
11961	Laboure College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus

22711	Southeast Community College-Lincoln Campus
21717	Union College
11920	University of Iowa
11922	University of Missouri-Columbia
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3660 LICENSED PRACTICAL NURSES

OCCUPATIONAL DESCRIPTION

Licensed practical nurses (LPN's) care for ill, injured, convalescent, and handicapped people in hospitals, clinics, private homes, nursing homes, and sanitariums under the supervision of physicians or registered nurses. They provide bedside patient care and help examine and treat patients. They bathe, dress, feed, and give medicines to patients. Also they try to make patients comfortable and to cheer them. Those who work in doctor's offices may set appointments, record medical information, and perform other clerical tasks. DOT 079.374-014

HOLLAND CODE

SEA (Social, Enterprising, Artistic)

SPECIALTIES

Psychiatric Technicians (079.374-026)
Practical Nurses (354.374-010)
Military Nursing Technicians (M36600)

NCIS RELATED OCCUPATIONS

2901	Registered Nurses
29011	Nurse Practitioners
29012	Nurse Anesthetists
3031	Respiratory Therapists
3040	Physician Assistants
3690	Health Technologists and Technicians
36906	Emergency Medical Technicians
36907	Surgical Technicians
52333	Medical Assistants
5236	Nursing Aids, Orderlies, and Attendants

WORK ACTIVITIES

- Dress, feed, bathe, and move patients.
- Take and record blood pressure, body temperature, pulse, and respiration rate.
- Observe and report patients' symptoms, changes, and reactions to treatment.
- Assemble and operate equipment.
- Perform lab work and sterilize equipment.
- Clean rooms and make beds.
- Keep charts and records.
- May assist in more advanced medical treatments or administer medication.
- May prepare meals and do light housekeeping in private homes.
- May specialize in one branch of medicine such as pediatrics or intensive care.

APTITUDES

- Be able to learn basic medical terminology and nursing techniques.
- Have good verbal abilities for speaking and writing.
- Be able to relate well to a variety of people.
- Have good space and form perception and hand and finger dexterity.
- Be able to carry out a variety of tasks and work calmly in a stressful situation.
- Be able to work within set standards and do work accurately.
- Be able to do moderate lifting.

WORK SETTING

Environment
Work indoors in patients' rooms, treatment rooms, laboratories, offices, and nurses' stations.

Hours
Work 35 to 40 hours a week; evening, weekend, and holiday hours are common; shifts may rotate; many part-time jobs available.

Employers
Hospitals, clinics, nursing homes, rehabilitation centers, sanitariums, patients' homes, educational institutions, camps, industries, government agencies, and correctional institutions.

CONSIDERATIONS

- Nurses may receive satisfaction from helping others or serving as members of health care teams.
- There is limited advancement without further education.

NEBRASKA EMPLOYMENT

About 5,422 licensed practical nurses are projected to be employed by 1991.

WAGES

Starting wages will be determined primarily on the work setting and level of responsibility. In

Nebraska LPN's may expect a starting range of between $13,550 and $17,330 per year. Location in the state does not appear to be a factor in determining the beginning wage. Nationally, location does play a factor in the starting salary with a range of between $12,500 and $21,500 per year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Somewhat Favorable
Factors
- Growing population, increase in life spans, and awareness of the importance of health care are reasons for the increase in employment of practical nurses.
- Some health agencies are hiring more registered nurses and fewer LPN's.
- Opportunities will be best in hospitals, nursing homes, home health agencies, and private nursing duty.

PREPARATION

SKILLS

- Knowledge of the principles of nursing.
- Skills in writing, listening, and speaking.
- Skills in observing, reporting and recording patients' conditions.
- Skills in problem solving and decision making.
- Skills in working with others.

LICENSING OR CERTIFICATION

- Licensed practical nurses must be licensed by the Nebraska Board of Nursing.
- To be licensed, an applicant must be 18 years old, be of good moral character, have a high school diploma or equivalent, and complete a program in an accredited school of nursing.
- License must be renewed every two years. Continuing education requirements must be met.

TRAINING

- The minimum educational requirement is graduation from one- or two-year accredited program.
- Programs are offered at technical or vocational schools, community colleges, hospitals, health agencies, or private educational institutions.
- Apprenticeship training is offered in some areas.

EDUCATIONAL PROGRAM

353	Nursing
386	Respiratory Therapy
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, biology, chemistry, psychology, health, math, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 65 and 240.
Guide for Occupational Exploration (2nd ed., 1984), pp. 513-522.
Occupational Outlook Handbook (1990-91 ed.), p. 199.
Military Career Guide (1988-89 ed.), p. 66.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
21311	Kearney State College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3690 HEALTH TECHNOLOGISTS AND TECHNICIANS

OCCUPATIONAL DESCRIPTION

Health technologists and technicians use medical equipment to help diagnose and treat various health problems. They may also conduct programs to control and prevent health hazards and diseases. Some mix and dispense drugs and prepare patients for surgery. Some fit patients with artificial limbs. Others take precise readings of patients' heart rates and brain waves or perform routine medical lab tests.

HOLLAND CODE

IRS (Investigative, Realistic, Social)

SPECIALTIES

Veterinary Laboratory Technicians (073.361-010)
Pharmacist Assistants (074.381-010)
Orthotists (078.261-018)
Prosthetists (078.261-022)
Pulmonary-Function Technicians (078.262-010)
Dialysis Technicians (078.362-014)
Electrocardiograph Technicians (078.362-018) (36901)
Electroencephalographic Technicians (078.362-022) (36902)
Cardiopulmonary Technologists (078.362-030)
Perfusionists (078.362-034)
Medical Laboratory Assistants (078.381-010)
Medical Laboratory Technicians (078.381-014) (36903)
Sanitarians (079.117-018) (36904)
Industrial Hygienists (079.161-010)
Home Health Technicians (079.224-010)
Animal Health Technicians (079.361-014)
Optometric Assistants (079.364-014) (36905)
Emergency Medical Technicians (079.374-010) (36906)
Surgical Technicians (079.374-022) (36907)
Orthopedic Assistant (712.661-010)
Military Orthopedic Technicians (M36908)
Military Orthotic Specialists (M36909)
Military Pharmacy Technicians (M36900)
Military Medical Services Technicians (M36906)
Military Cardiopulmonary Technicians (M36902)

NCIS RELATED OCCUPATIONS

1473	Inspectors and Compliance Officers
1845	Chemists
1854	Biological Scientists
18542	Biologists
2810	Optometrists
2901	Registered Nurses
3031	Respiratory Therapists
3040	Physician Assistants
3620	Clinical Laboratory Technologists
3660	Licensed Practical Nurses
3820	Biological Technologists and Technicians
3831	Chemical Technologists and Technicians
3890	Science Technologists
5123	Fire Fighters
5236	Nursing Aides, Orderlies, and Attendants

WORK ACTIVITIES

- Prepare vaccines, biologicals, and serums for prevention of animal diseases.
- Mixes and dispenses prescribed medicines and pharmaceutical preparations under supervision of pharmacists.
- Provide care to patients with disabling conditions of limbs and spine by fitting and preparing devices called orthoses under direction of physicians.
- Provide care to patients with partial or total absence of limbs by planning and fitting devices known as prothesis under guidance of physician.
- Set up and operate artificial kidney machines to provide dialysis treatment for patients with kidney disorders or failure.
- Record variations in action of heart muscle to provide data for diagnosis of heart ailments.
- Measure impulse frequencies and differences in the brain for use in diagnosis of brain disorders.
- Perform routine tests in medical laboratory under supervision of medical technologists for use in treatment and diagnosis of disease.
- Plan, develop, and execute environmental health programs.
- Conduct health programs in industrial plants or governmental organizations to deal with health hazards and diseases.
- Perform combination of tasks to assist optometrists.
- Administer first-aid treatment to and transport

sick or injured persons to medical facilities.
- Perform any combination of tasks before, during, and after operation.
- Apply, adjust, and remove casts, assemble traction apparatus, and fit strappings and splints for orthopedic patients according to medical staff instructions.

APTITUDES

- Be able to learn the basics and techniques of the medical procedures of the chosen occupation.
- Have good numerical and verbal abilities.
- Have good space and form perception, physical coordination, and finger and hand dexterity.
- Be able to make decisions and work accurately.
- Be able to relate to people and react calmly.
- Be able to work in stressful environments.

WORK SETTING

Environment
  Work indoors.
Hours
  Work 40 hours a week; some schedules may rotate or be irregular and include evening, night, weekend and holiday hours.
Employers
  Hospitals, clinics, private surgical facilities, health maintenance organizations, ambulance companies, rescue services, police and fire departments, optometrists' offices, government agencies, manufacturers, educational institutions, research centers, and doctor's offices.

CONSIDERATIONS

- Jobs may offer satisfaction from working with medical and scientific processes and helping people.
- Work may be stressful.

NEBRASKA EMPLOYMENT

About 2,394 health technologists and technicians are projected to be employed by 1991.

WAGES

Salaries for health technologists and technicians will vary widely depending on the amount of education and training they have completed in a particular area of specialization. The size, geographic location, as well as the type of services provided by the employer will also impact the salary range. In Nebraska, starting salaries for all health technologists and technicians range between $10,000 and $20,500 a year. Nationally, entry level salaries compare favorably with Nebraska salaries with a range of $10,000 to $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Somewhat Favorable
Factors
- The aging population, the growing interest in health, and the growth in medical insurance that pay for diagnostic and outpatient treatment may increase job opportunities.
- New approaches to paying for care, attempts to lower health care costs, and decreases in government funding may slow employment growth.

PREPARATION

SKILLS

- Knowledge of the medical terminology and processes, procedures, and equipment associated with the chosen occupation.
- Knowledge of hospital and medical procedures.
- Skills in report writing and recordkeeping.
- Skills in communication.
- Skills in dealing with a variety of people.
- Skills in working accurately and within precise standards.

TRAINING

- Training varies from on-the-job training to apprenticeship programs to formal training programs that last one to four years.

EDUCATIONAL PROGRAM

253	Engineering Technologies
353	Nursing
363	Medicine
366	Allied Medical Services
371	Optometric Services
375	Clinical Health Sciences
383	Medical Laboratory Technology
521	Physical Sciences
524	Chemistry
529	Physics
531	Life Sciences

631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, algebra, geometry, biology, chemistry, physics, health, health occupations, and typing. A college preparatory curriculum is suggested.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 56, 61-62, 64-65, and 675.
Guide to Occupational Exploration (2nd ed., 1984), pp. 127-132, 188-218, 519-522, 561-565.
Occupational Outlook Handbook (1990-91 ed.), pp. 187-208
Military Career Guide (1988-89 ed.), pp. 61, 70, 71, and 72.

SCHOOLS

21801	Bellevue College
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
11943	Kansas Newman College
21311	Kearney State College
11945	Lakewood Community College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
11920	University of Iowa
11922	University of Missouri-Columbia
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

36901 ELECTROCARDIOGRAPH TECHNICIANS

OCCUPATIONAL DESCRIPTION

Electrocardiograph (EKG) technicians use electronic equipment to record the electrical changes that occur during heartbeats. Doctors use these records, called electrocardiograms, to detect heart damage or diseases. DOT 078.362-018

HOLLAND CODE

RCI (Realistic, Conventional, Investigative)

NCIS RELATED OCCUPATIONS

3031	Respiratory Therapists
3690	Health Technologists and Technicians
36902	Electroencephalographic Technologists
36903	Medical Laboratory Technicians
36906	Emergency Medical Technicians

WORK ACTIVITIES

- Prepare patient and explain procedure.
- Place electrodes on the patient's chest, arms, and legs.
- Adjust EKG machines and move chest electrodes to record beating in different parts of the heart.
- Make notes on the record.
- Edit and mount final results of tests and send results to the cardiologists.
- Care for equipment.
- Schedule appointments, type medical diagnoses, and maintain patients' files.

APTITUDES

- Be able to learn the techniques of operating electrocardiograph equipment.
- Have numerical ability and verbal ability to communicate with patients and other staff.
- Be able to visualize space and forms and see well.
- Be able to make judgments based on data, work within precise standards and measurements, and record information accurately.
- Have average finger and hand dexterity and physical coordination and be able to reach for objects.
- Be able to remain calm in emergencies.

WORK SETTING

Environment
  Work indoors in examining rooms and offices.
Hours
  Work 40 hours a week; may include evening, weekend, and holiday hours; may be on call; part-time work may be available.
Employers
  Hospitals, clinics, and doctors' offices.

CONSIDERATIONS

- Job satisfaction may come from working with scientific processes and medical equipment and from helping others.

NEBRASKA EMPLOYMENT

About 78 electrocardiograph technicians are projected to be employed by 1991.

WAGES

In Nebraska, starting salaries for EKG technicians range from $13,500 for individuals trained on the job to $20,000 for technicians who have completed a two-year associate degree. Nationally, entry level salaries tend to parallel those of Nebraska

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Favorable
Factors
  - Growth will result from more use of the EKG equipment during routine medical exams and before surgery.
  - Another factor increasing demand is the availability of health insurance that pays for testing and diagnosis.

PREPARATION

SKILLS

- Knowledge of medical terminology relating to heart functions and EKG processes.

- Knowledge of EKG equipment and recording techniques.
- Knowledge of hospital procedures.
- Skills in report writing.
- Skills in dealing with a variety of people.

LICENSING OR CERTIFICATION

- Certification is not required but is available from the National Board of Cardiovascular Testing.

TRAINING

- The minimum educational requirement is a high school diploma plus one year of on-the-job training.
- Some employers require applicants to have a certificate or two-year associate degree from a vocational school, community college, university, or hospital.

EDUCATIONAL PROGRAM

385 Diagnostic and Treatment Services

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include composition, math, biology, chemistry, physics, psychology, and typing.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 62.
Guide for Occupational Exploration (2nd ed., 1984), pp.519-522.
Occupational Outlook Handbook (1990-91 ed.), p. 195.

SCHOOLS

49802	Bergan Mercy School of Radiologic Technology
22307	Central Community College-Platte Campus
21606	Dana College
21507	Doane College
49818	Immanuel Medical Center School of Radiologic Technology
21311	Kearney State College
11961	Laboure College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
22205	Western Nebraska Community College-Scottsbluff Campus

36902 ELECTROENCEPHALOGRAPHIC TECHNICIANS

OCCUPATIONAL DESCRIPTION

Electroencephalographic (EEG) technicians use electronic equipment to measure and record patient's brain waves. Doctors use the records for a variety of purposes such as finding brain damage and diagnosing infectious diseases and disorders of the brain. DOT 078.362-022

HOLLAND CODE

RCS (Realistic, Conventional, Social)

NCIS RELATED OCCUPATIONS

3690	Health Technologists and Technicians
36901	Electrocardiograph Technicians
36903	Medical Laboratory Technicians
36906	Emergency Medical Technicians

WORK ACTIVITIES

- Take medical histories.
- Help patients relax and prepare them for the tests.
- Check that EEG machines are working correctly.
- Adjust machines to do a series of brain wave tests.
- Take notes on patient's responses to the tests.
- May write descriptions of EEG records to be used by doctors.
- May supervise others, arrange work schedules, and manage laboratories.
- May keep records, schedule appointments, and order supplies.

APTITUDES

- Be able to learn the techniques of operating electroencephalographic equipment.
- Have numerical ability and verbal ability to communicate with patients and other staff.
- Be able to see and hear well, visualize space and form relationships, and reach for objects.
- Have good hand and finger dexterity and physical coordination.
- Be able to make judgments based on data, work within precise standards and measurements, and record information accurately.
- Be able to relate to people who are ill and work as part of a team.
- Be able to remain calm in emergencies and work in stressful situations.

WORK SETTING

Environment
    Work indoors in examining rooms and offices.
Hours
    Work 40 hours a week with evening, weekend, and holiday hours possible; may be on call.
Employers
    Hospitals, clinics, and doctors' offices.

CONSIDERATIONS

- Workers may receive job satisfaction from contributing to early diagnosis and treatment of illnesses and from working with scientific processes and medical equipment.
- May work with patients who are ill and unruly.

NEBRASKA EMPLOYMENT

About 40 electroencephalographic technicians are projected to be employed by 1991.

WAGES

In Nebraska, starting salaries for EEG technicians range from $13,500 for technicians trained on the job to $20,000 a year for registered EEG technologists who have completed a one or two year accredited training program. Nationally, entry level salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Favorable
Factors
- Increased demand for these workers is related to the growing concern for health and the rise in the availability of health insurance that pays for testing and diagnosis.

- Another factor adding to job demand is increased use of EEG technology in surgery, diagnosis, and monitoring patients with brain disease.

PREPARATION

SKILLS

- Knowledge of medical terminology relating to brain functions and EEG processes.
- Knowledge of EEG recording techniques and skills in using EEG equipment.
- Skills in report writing.
- Skills in dealing with a variety of people.
- Knowledge of hospital procedures.

LICENSING OR CERTIFICATION

- Licensing is not required but it is helpful to be registered by the American Board of Registration of Electroencephalographic Technologists.
- To be registered, a person must have one year of training, complete one year of laboratory work experience, and pass an exam.

TRAINING

- Some technologists receive on-the-job training under the supervision of experienced EEG personnel.
- Formal training programs last from one to two years and are available from vocational schools, community colleges, hospitals, or medical schools.
- In the United States there are about 20 training programs in EEG technology approved by the Committee of Allied Health Education and Association of the American Medical Association.

EDUCATIONAL PROGRAM

385	Diagnostic and Treatment Services
362	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, math, biology, chemistry, physics, psychology, health, typing, and electronics.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 62.

Guide for Occupational Exploration (2nd ed., 1984), pp. 519-522.

Occupational Outlook Handbook (1990-91 ed.), p. 193.

SCHOOLS

49802	Bergan Mercy School of Radiologic Technology
22307	Central Community College-Platte Campus
21606	Dana College
21507	Doane College
49818	Immanuel Medical Center School of Radiologic Technology
21311	Kearney State College
11961	Laboure College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
22205	Western Nebraska Community College-Scottsbluff Campus

36903 MEDICAL LABORATORY TECHNICIANS

OCCUPATIONAL DESCRIPTION

Medical laboratory technicians perform laboratory tests to aid in diagnosis and treatment of diseases. They work under the supervision of other health professionals such as medical technologists, pathologists, and other physicians. DOT 078.381-014

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Military Medical Laboratory Technicians (M36903)

NCIS RELATED OCCUPATIONS

1854	Biological Scientists
18542	Biologists
1855	Medical Scientists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36901	Electrocardiograph Technicians
36902	Electroencephalographic Technicians
36904	Sanitarians
3820	Biological Technologists and Technicians
3831	Chemical Technologists and Technicians
3890	Science Technologists

WORK ACTIVITIES

- Collect body fluids and specimens from patients as ordered by doctors.
- Prepare fluids and specimens for testing.
- Use equipment and chemicals to perform tests.
- Record results of tests.

APTITUDES

- Be able to learn medical lab techniques and terminology.
- Have good numerical ability and verbal ability for speaking and writing.
- Be able to make decisions based on set standards, stay within exact time limits, handle a variety of activities, and do paperwork accurately.
- Have ability to see space and form relationships and differences in shades of color and have good eye-hand coordination.
- Be able to work under pressure.

WORK SETTING

Environment
    Work indoors in laboratories and offices.
Hours
    Work 40 hours a week; weekend, evening, and holiday hours are possible.
Employers
    Hospitals, clinics, doctors' offices, veterinary clinics, research centers, colleges and universities, medical schools, government agencies, and commercial labs.

CONSIDERATIONS

- Job may give satisfaction by helping people with medical problems and working with scientific problems.
- Accuracy is very important in this job.

NEBRASKA EMPLOYMENT

About 754 medical laboratory technicians are projected to be employed by 1991.

WAGES

In Nebraska, starting salaries for medical laboratory technicians range between $13,104 and $19,200. Nationally, entry level salaries tend to be somewhat higher with a range of $16,000 to $25,000 a year. In general, those employed in large cities receive the highest salaries.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors

- The growing population, increased interest in health, and an increase in the availability of health insurance that pays for testing and diagnosis may cause growth in this occupation.
- Due to the increased use of automated lab test equipment some employers may hire technicians rather than technologists because technicians are usually paid less.

PREPARATION

SKILLS

- Knowledge of the basics of medical laboratory methods and use of lab testing equipment.
- Skills in communication for speaking and writing.
- Skills in recordkeeping and report writing.
- Skills in dealing with a variety of people.

LICENSING OR CERTIFICATION

- Licensing is not required but certification is available from the American Society of Clinical Pathologists or the American Medical Technologists.
- To be certified, a person must have completed a two-year training program and pass an exam.

TRAINING

- The minimum educational requirement is an associate degree from an approved program.
- Clinical experience in an approved lab is also required.
- Job chances may be better for graduates of programs approved by the American Medical Associations Committee on Allied Health, Education, and Accreditation.
- Training may be obtained thorugh an apprenticeship program.

EDUCATIONAL PROGRAM

375	Clinical Health Services
383	Medical Laboratory Technologies
386	Respiratory Therapy Technology
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, biology, chemistry, physics, health, health occupations, and typing

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 62.
Guide for Occupational Exploration (2nd ed., 1984), pp. 127-132.
Occupational Outlook Handbook (1990-91 ed.), p. 187.
Military Career Guide (1988-89 ed.), p. 63.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21606	Dana College
21507	Doane College
49819	Immanuel Medical Center School of Respiratory Therapy
11943	Kansas Newman College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
11920	University of Iowa
11922	University of Missouri-Columbia
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

36904 SANITARIANS

OCCUPATIONAL DESCRIPTION

Sanitarians work for long-range pro-tection from health hazards by enforcing laws and educating the public. They may specialize in such areas as housing, pest control, air pollution, water treatment, disease investigation, or health education. DOT 079.117-018

HOLLAND CODE

ISR (Investigative, Social, Realistic)

NCIS RELATED OCCUPATIONS

1473	Inspectors and Compliance Officers
1845	Chemists
1854	Biological Scientists
18542	Biologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians

WORK ACTIVITIES

- Interpret and enforce laws regarding sanitation.
- Visit motels, waste disposal stations, production plants, schools, hospitals, and swimming pools to investigate present sanitary conditions.
- Recommend corrective measures and follow up to insure unsanitary conditions have been corrected.
- Collect samples for laboratory tests and based on results, decide if conditions are acceptable.
- Organize and conduct training programs.
- Report findings to appropriate authorities.

APTITUDES

- Be able to learn the basics of public health and sanitation.
- Have good numerical and verbal abilities.
- Be able to work with data, make decisions based on facts, and work according to set standards.
- Be able to plan, organize, and supervise.
- Have good space and form and color perception.
- Be able to do moderate lifting.
- Be able to work with a variety of people some of whom may be uncooperative.

WORK SETTING

Environment
    Work is indoors and outdoors; sometimes in unpleasant surroundings.
Hours
    Work 40 hours a week with longer hours possible; may include evening and weekend hours.
Employer
    Federal, state, and local governments, food processing companies, hospitals, manufacturers, educational institutions, pest control services, food vendors, and self-employed as consultants.

CONSIDERATIONS

- May be exposed to health hazards, fumes, odors, and toxic conditions.

NEBRASKA EMPLOYMENT

About 100 sanitarians are projected to be employed by 1991.

WAGES

Starting salaries for licensed sanitarians range between $14,500 and $22,500 in Nebraska. Nationally, salaries are slightly higher at a range of $16,500 to $25,000 a year. Most starting Federal salaries will be somewhat higher than state and local government or private sector employment.

EMPLOYMENT GROWTH

Nebraska
    Somewhat Favorable
National
    Somewhat Favorable
Factors
- The outlook depends on public concern about potential health and safety hazards and on the trend to cut government spending.
- Most openings are to replace those who leave the occupation.

PREPARATION

SKILLS

- Knowledge of and ability to apply public health principles.
- Knowledge of federal, state, and local public health laws.
- Skills in using lab and testing equipment.
- Skills in dealing with the public.
- Skills in communication.
- Skills in observation, decision making, and interpretation of laws.

LICENSING OR CERTIFICATION

- Sanitarians must be licensed by the Nebraska Board of Registration for Sanitarians.
- To be licensed a person must have a bachelors degree or higher with at least 30 hours in natural science, have one year experience, and pass an exam.
- The license must be renewed biennially.

TRAINING

- The minimum educational requirement is a bachelors degree in environmental health or a related physical or biological science field is required.

EDUCATIONAL PROGRAM

112	Animal Sciences
114	Food Sciences
253	Engineering Technologies
524	Chemistry
529	Physics
531	Life Sciences

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, biology, chemistry, physics, and health.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 64.
Guide for Occupational Exploration (2nd ed., 1984), pp. 561-565
Occupational Outlook Handbook (1990-91 ed.), p. 41.

SCHOOLS

22307	Central Community College-Platte Campus
22501	Central Community College-Hastings Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
22601	Nebraska Indian Community College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

36905 OPTOMETRIC ASSISTANTS

OCCUPATIONAL DESCRIPTION

Optometric assistants do a variety of jobs to assist optometrists who examine eyes and prescribe corrective lenses. DOT 079.364-014

HOLLAND CODE

SCI (Social, Conventional, Investigative)

SPECIALTIES

Military Optometric Technicians (M36905)

NCIS RELATED OCCUPATIONS

2810	Optometrists
3690	Health Technologists and Technicians
6864	Optical Goods Workers

WORK ACTIVITIES

- Keep records, schedule appointments, and do bookkeeping, correspondence, and filing.
- Record patient's history and prepare patient for visual exam.
- Help in testing vision.
- Teach patient care and use of glasses and contact lenses.
- Help patient to choose frames, adjust and fix glasses, and modify contact lenses.
- Work with patient in vision therapy.
- Keep inventory of materials and clean instruments.

APTITUDES

- Be able to learn the practices of optometric assisting.
- Be able to use words and numbers for recordkeeping, bookkeeping, and other clerical activities.
- Have good space and form perception, color perception, and general coordination.
- Be able to relate to a variety of people.
- Be able to make decisions based on measurements and other data.
- Be able to stand for long periods of time.

WORK SETTING

Environment
- Work indoors in offices, labs, and treatment rooms.

Hours
- Work 40 hours a week.

Employers
- Optometrists' offices, clinics, and health maintenance organizations.

CONSIDERATIONS

- Job satisfaction may come from helping people improve their physical well-being.

NEBRASKA EMPLOYMENT

About 2,394 health technologists and technicians are projected to be employed by 1991. Optometric assistants are included in this group.

WAGES

Starting wages for optometric assistants vary somewhat according to the amount of training completed, experience and the size and geographic location of the employer. In Nebraska, salaries range between $12,000 and $15,000 a year. Nationally, starting salaries compare favorably with Nebraska with a slightly higher upper range of $18,000 a year.

EMPLOYMENT GROWTH

Nebraska
- Somewhat Favorable

National
- Favorable

Factors
- Population growth and a greater demand for eye-care services will increase opportunities.
- An increasing interest of optometrists in hiring assistants to lighten their work load may add to the need for these workers.

PREPARATION

SKILLS

- Knowledge of optometric testing equipment and its use.
- Skills in assisting patients with frame selection, adjusting frames, and teaching patients about care of glasses and contact lenses.
- Skills in recordkeeping, filing, bookkeeping, and recording patient histories.
- Skills in communication and dealing with people.

TRAINING

- The minimum educational requirement is a high school diploma.
- Some optometric assistants are trained on the job.
- Other employers require that their assistants have one year of formal training in optometric assisting from a community college or technical school.
- Training in some occupations may be obtained through apprenticeship training.

EDUCATIONAL PROGRAM

366	Allied Health Services
369	Optometry
371	Optometric Services
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High School subjects should include courses in algebra, geometry, biology, health, health occupations, and accounting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 64-65.

Guide for Occupational Exploration (2nd ed., 1984), pp. 519-522.

Military Career Guide (1988-89 ed.), p. 69.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21507	Doane College
21311	Kearney State College
11945	Lakewood Community College
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
49823	Omaha College of Health Careers
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center

36906 EMERGENCY MEDICAL TECHNICIANS

OCCUPATIONAL DESCRIPTION

Emergency medical technicians (EMT) provide immediate medical care to injured or ill people. They determine the nature and extent of illness or injury and provide first aid and other emergency medical care to stabilize the patient's condition. They may transport the patients to hospitals. DOT 079.374-010

HOLLAND CODE

ESI (Enterprising, Social, Investigative)

SPECIALTIES

Military Medical Services Technicians (M36906)

NCIS RELATED OCCUPATIONS

2901	Registered Nurses
3031	Repiratory Therapists
3040	Physician Assistants
3660	Licensed Practical Nurses
3690	Health Technologists and Technicians
36901	Electrocardiograph Technicians
36902	Electroencephalographic Technologists
5123	Fire Fighters
5233	Health Aides

WORK ACTIVITIES

- Take directions from dispatchers and drive emergency vehicle to given place.
- Decide nature and extent of injury or illness.
- Give first-aid treatment at site of emergency or in emergency vehicle.
- Get instructions for further treatment from medical personnel at hospital.
- Arrange for bringing victims to treatment center.
- Help take victims from vehicle and transfer them to treatment center.
- Write reports, replace supplies, and inspect and maintain ambulance and equipment.
- Transfer patients from hospitals to nursing homes.

APTITUDES

- Be able to learn the practices and techniques of emergency medical treatment.
- Have good numerical and verbal abilities.
- Have good space and form perception, finger and hand dexterity, and general coordination and some physical strength.
- Be able to relate to people, react calmly, and help others feel at ease.
- Be able to make decisions based on observation and data.
- Be able to make quick decisions and take responsibility.

WORK SETTING

Environment

Work indoors in ambulances, hospitals, and buildings where emergencies occur and outdoors at scenes of emergencies.

Hours

Work 40 hours a week; schedules may be irregular or rotating and include evening, night, weekend, or holiday hours.

Employers

Ambulance companies, rescue services, and police and fire departments.

CONSIDERATIONS

- People in this occupation may receive personal satisfaction from their work.
- The job is stressful at times.
- Some EMT's advance to supervisory or management jobs.

NEBRASKA EMPLOYMENT

About 1,028 emergency medical technicians are projected to be employed by 1991.

WAGES

Starting salaries for licensed emergency medical technicians vary according to the type of employer and geographic location as well as the individual's training and experience. In Nebraska, entry level salaries for EMT's employed by ambulance and rescue services range between $13,000 and $16,000 a year. EMT's employed by police and fire departments usually earn the same as police officers and firefighters. The entry level ranges between $14,000 and $23,500 a year. The fringe benefits offered by ambulance and rescue ser-vices will vary. EMT's employed by hospitals, police and fire departments receive the same benefits as other employees.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- New job opportunities may be somewhat limited since over half of the EMT's serve on voluntary emergency or rescue services or are employed as fire, police, or safety health personnel.
- Most openings will occur as people leave the field.
- Reduced budgets have caused the demand to decrease.

PREPARATION

SKILLS

- Knowledge of basic and advanced life support and emergency treatment procedures.
- Knowledge of proper techniques for moving injured patients.
- Skills in communication, listening, and following orders.
- Skills in driving emergency vehicles.
- Skills in maintaining and repairing equipment.
- Skills in recordkeeping and report writing.

LICENSING OR CERTIFICATION

- Emergency medical technicians must be licensed by the Nebraska Bureau of Examining Boards in Advanced Emergency Medical Care.
- To be licensed an applicant must be at least 21 years old, have a high school diploma or equivalent, have good mental and physical health, complete an approved training program, and pass the exam.
- The license must be renewed every two years.

TRAINING

- A person must complete an 81-hour training course in emergency medical care approved by the United States Department of Transportation.
- The training programs are offered by the community colleges throughout Nebraska.
- In addition, three months of patient or health care experience and six months of emergency ambulance or rescue service experience is required.

EDUCATIONAL PROGRAM

363	Medicine
381	Emergency Medical Technology
385	Diagnostic and Treatment Services
386	Respiratory Therapy Technology
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in algebra, geometry, biology, chemistry, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 65.
Guide for Occupational Exploration (2nd ed., 1984), pp. 519-522.
Occupational Outlook Handbook (1990-91 ed.), p. 196.
Military Career Guide (1988-89 ed.), p. 65.

SCHOOL

49802	Bergan Mercy School of Radiologic Technology
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
49818	Immanuel Medical Center School of Radiologic Technology
21311	Kearney State College
11961	Laboure College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus

21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

36907 SURGICAL TECHNICIANS

OCCUPATIONAL DESCRIPTION

Surgical technicians assist surgeons and anesthesiologists before, during, and after surgery under the supervision of registered nurses. DOT 079.374-022

HOLLAND CODE

ISR (Investigative, Social, Realistic)

SPECIALTIES

Military Operating Room Technicians (M36907)

NCIS RELATED OCCUPATIONS

2901	Registered Nurses
3040	Physician Assistants
3660	Licensed Practical Nurses
3690	Health Technologists and Technicians
5236	Nursing Aides, Orderlies, and Attendants

WORK ACTIVITIES

- Prepare patient for operation by washing, shaving, and sterilizing area to be operated on.
- Prepare and place equipment and supplies in operating room and adjust lights as directed.
- Aid medical personnel in scrubbing and putting on sterile garments.
- Help count sponges, needles, and cut stitches as directed by surgeon.
- Maintain sterile environment in operating room, handle specimens, and assist in giving blood or plasma.
- Transfer patient to stretcher and wheel to recovery room.
- Clean and restock operating room.

APTITUDES

- Be able to learn the basics of operating room procedures.
- Be able to communicate with staff and follow written and spoken directions.
- Have average numerical abilities.
- Have good space and form perception, physical coordination, and finger and hand dexterity.
- Be able to make decisions based on prescribed standards or directions and to handle paperwork and detailed procedures accurately.
- Be able to work in a stressful environment.
- Have ability to relate to a variety of people.
- Be able to stand for long periods of time.
- Be able to react calmly in emergency situations.

WORK SETTING

Environment
  Work indoors in operating, supply, sterilization and recovery rooms.

Hours
  Work 40 hours a week; may be on call to handle emergency surgeries.

Employers
  Hospitals, clinics, private surgical facilities, and health maintenance organizations.

CONSIDERATIONS

- Job offers feelings of satisfaction from helping people.
- Technicians usually work under stress.

NEBRASKA EMPLOYMENT

About 328 surgical technicians are projected to be employed by 1991.

WAGES

Entry level salaries for surgical technicians will vary according to the type of education or training completed as well as the geographic location of the employer. In Nebraska, starting salaries range between $13,500 and $21,500 a year. Graduates of accredited two-year programs will receive the higher salary offered. Nationally, entry level salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
  Favorable

National
  Somewhat Favorable

Factors
- More job openings should be available as surgical technicians are expected to take on more of the routine nursing tasks in the operating room.

- Graduates of accredited two-year community college surgical technician programs should be in demand.

PREPARATION

SKILLS

- Knowledge of basic nursing and surgical procedures, safety practices, and operating room techniques.
- Skills in handling surgical instruments.
- Skills in dealing with patients and staff.

LICENSING OR CERTIFICATION

- Licensing is not required but certification by the Association of Surgical Technologists adds professional prestige and increases job opportunities. Continuing education or reexamination is required to maintain certification, which must be renewed every six years.

TRAINING

- Most employers prefer to hire surgical technicians who have been trained in one- to two-year specialized programs in vocational and technical schools, hospitals, or community colleges.
- Some technicians receive their training on the job.

EDUCATIONAL PROGRAM

353	Nursing
385	Diagnostic and Treatment Services
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in biology, chemistry, health, and health occupations.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 65.
Guide for Occupational Exploration (2nd ed., 1984), pp. 519-522.
Occupational Outlook Handbook (1990-91 ed.), p. 208.
Military Career Guide (1988-89 ed.), p. 68.

SCHOOLS

21801	Bellevue College
49802	Bergan Mercy School of Radiologic Technology
49803	Bishop Clarkson College
49704	Bryan Memorial Hospital School of Anesthesia
49717	Bryan Memorial Hospital School of Nursing
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21808	Grace College of the Bible
49818	Immanuel Medical Center School of Radiologic Technology
21311	Kearney State College
11961	Laboure College
49511	Mary Lanning Memorial Hospital School of Radiologic Technology
22402	McCook Community College
49822	Methodist College of Nursing and Allied Health
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
49227	Regional West Medical Center School of Radiologic Technology
49812	Saint Joseph Hospital School of Radiologic Technology
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
21717	Union College
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3710 ENGINEERING TECHNOLOGISTS AND TECHNICIANS

OCCUPATIONAL DESCRIPTION

Engineering technologists and technicians assist engineers and surveyors in all phases of work from research and design to production, construction, and inspection.

HOLLAND CODE

RIE (Realistic, Investigative, Enterprising)

SPECIALTIES

Computer-Aided Design Technicians (003.362-010)
Civil Engineering Technicians (005.261-014)
Chemical Engineering Technicians (008.261-010)
Metallurgical Technicians (011.261-010)
Testers (011.361-010)
Agricultural Engineering Technicians (013.161-010)
Instruments Surveyor Assistants (018.167-034)
Cartographic Drafters (018.261-010)
Topographical Drafters (018.261-014)
Photogrammetrists (018.261-026)
Test Technicians (019.161-014)
Specification Writers (019.267-010)
Sound Mixers (194.262-018)
Recording Engineers (194.362-010)
Military Surveying Technicians (M37100)
Military Mapping Technicians (M37101)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1623	Metallurgical Engineers
1624	Mining Engineers
1625	Petroleum Engineers
1626	Chemical Engineers
1627	Nuclear Engineers
1628	Civil Engineers
1632	Agricultural Engineers
1643	Land Surveyors
1733	Statisticians
3711	Electrical and Electronic Engineering Technicians
3712	Industrial Engineering Technicians
3713	Mechanical Engineering Technicians
3720	Drafters
3890	Science Technologists and Technicians

WORK ACTIVITIES

- Use information from blueprints to design detailed drawings, charts, and sketches of work to be done.
- Devise and conduct tests to ensure that products meet the specifications of engineers.
- Study ways to improve the quality of a product or efficiency of an operation.
- Conduct studies and help solve problems.
- Record meter readings, take measurements, and prepare charts and graphs.

APTITUDES

- Be able to learn to assist engineers and surveyors.
- Have good use of words and numbers.
- Be able to do detailed work accurately.
- Have ability to visualize objects from pictures and descriptions.
- Be able to see slight differences in objects and drawings.
- Have average eye-hand coordination and use of fingers and hands.
- Be able to work within set standards.

WORK SETTING

Environment

Work mostly indoors; surveying work and some inspecting done outdoors; may have to travel to work sites.

Hours

Work 40 hours a week.

Employers

Manufacturers, government agencies, consulting firms, research laboratories, mining and oil companies, and construction companies.

CONSIDERATIONS

- Work may be done around noisy equipment.
- Work sites may be wet and cold in the winter and hot in the summer.

NEBRASKA EMPLOYMENT

About 2,890 engineering technologists and technicians are projected to be employed by 1991.

WAGES

Entry level salaries for engineer technologists and technicians vary primarily according to the area of specialization. In Nebraska, starting salaries span a range of between $14,300 and $20,200 a year. Nationally, entry level salaries are somewhat higher at a range of between $17,000 and $24,500 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors

- In Nebraska, there are very few graduates with training as engineering technologists and technicians.
- Activity in the construction and manufacturing industries has improved, increasing the demand for technologists and technicians.

PREPARATION

SKILLS

- Knowledge of basic engineering and surveying procedures.
- Skills in using engineering and surveying instruments.
- Skills in writing and presenting reports.
- Skills in drafting.
- Skills in basic programming and computer-aided design.
- Skills in performing mathematical computations.

TRAINING

- Most employers prefer post-high school training or some experience.
- Formal training is available at community colleges and four-year colleges and universities.
- Other training is available through apprenticeship programs and on-the-job training.

EDUCATIONAL PROGRAM

251	Engineering
253	Engineering Technologies
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in advanced math, chemistry, physics, drafting, industrial arts, manufacturing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 24, 27, 31, 34, and 143.
Guide for Occupational Exploration (2nd ed., 1984), pp. 161-170.
Occupational Outlook Handbook (1990-91 ed.), p. 219.
Military Career Guide (1988-89 ed.), pp. 87 and 93.

SCHOOLS

22307	Central Community College-Platte Campus
21102	Chadron State College
11930	Colorado School of Mines
21805	Creighton University
21507	Doane College
11959	Hawkeye Institute of Technology
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3711 ELECTRICAL AND ELECTRONIC ENGINEERING TECHNICIANS

OCCUPATIONAL DESCRIPTION

Electrical and electronic engineering technicians use hand tools and testing devices to develop, manufacture, and service electrical and electronic equipment. They work with engineers and scientists. Also they install and operate such equipment. The types of equipment they work with range from radio, radar, television, and computer equipment to industrial and medical measuring and control devices. DOT 003.161-010, 003.161-014

HOLLAND CODE

RIE (Realistic, Investigative, Enterprising)

SPECIALTIES

Semiconductor-Development Technicians (003.161-018)
Instrumentation Technicians (003.261-010)
Calibration Laboratory Technicians (019.218-010)
Meters Superintendents (184.167-194)
Technical Testing Engineer (194.381-010)
Microelectronics Technicians (590.362-022)
Military Broadcast and Recording Technicians (M37110)

NCIS RELATED OCCUPATIONS

1341	Communications Operations Managers
1622	Aerospace Engineers
1633	Electrical and Electronic Engineers
3710	Engineering Technologists and Technicians
3930	Radio Operators
4230	Technical Sales Workers and Service Advisors
6153	Electrical and Electronic Advisors Repairers
6154	Data Processing Equipment Repairers
6867	Electronic Assemblers

WORK ACTIVITIES

- Design charts and diagrams of work to be done using information from blueprints and engineers' specifications.
- Set up test equipment and conduct tests to ensure that the product meets the required standards.
- Discuss layout and assembly plans with engineers.
- Design and modify systems and equipment models.
- Evaluate test results and recommend adjustments.
- Diagnose causes of malfunction and perform preventive and corrective maintenance.
- Write technical reports and develop charts and graphs to describe electronic systems.

APTITUDES

- Have ability to learn the terms and principles of electronics.
- Have good verbal and numerical abilities.
- Be able to make decisions based on data and experience.
- Have good space and form perception, eye-hand coordination, and hand and finger dexterity.
- Be able to do detailed, precise work within set standards and to see important detail.
- Be able to concentrate on detailed work for long periods of time.

WORK SETTING

Environment

Work mainly indoors in laboratories or repair facilities or outdoors at construction or repair sites.

Hours

Work 40 hours a week; might be called for emergency repairs on off hours.

Employers

Government agencies, manufacturing firms, industries, engineering firms, sales and service companies, television and broadcasting industry, telephone companies, public utilities, and self-employed.

CONSIDERATIONS

- Opportunities for advancement are good in this field.
- Technicians may be subject to electrical shocks or minor cuts and bruise.

NEBRASKA EMPLOYMENT

About 2,771 electrical and electronic engineering technicians are projected to be employed by 1991.

WAGES

Starting salaries for electrical and electronic engineering technicians vary according to the type of education or training completed and the area of specialization. In Nebraska, entry level salaries range between $16,000 and $22,400 a year. Nationally, entry level wages compare favorably with Nebraska with a somewhat higher upper range of $26,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Favorable
National
  Favorable
Factors
- Growth should result from an increased demand for computers, communications equipment, and electronic consumer goods.

PREPARATION

SKILLS

- Knowledge of laws and principles of electronic circuitry.
- Skills in using electronic testing equipment.
- Skills in analyzing technical information and troubleshooting and problem solving.
- Skills in reading blueprints and diagrams.
- Skills in recordkeeping and report writing.
- Skills in methodical thinking and working.

LICENSING OR CERTIFICATION

- For those who test radio and transmitting equipment, a first- or second-class commercial radiotelephone operator's license from the Federal Communications Commission is required.
- Certification is not required but encouraged.
- Certification is available thorugh the Electronics Technicians Association International. Depending on years of education and experience technicians may be certified at one of four levels: Associate, Journeyman, Senior, Master.

TRAINING

- Most employers prefer those with one to two years of education from a technical school or community college.
- Apprenticeship and on-the-job training is also available.
- Training also may be received in the military and from correspondence schools.
- Previous work experience in industry and hobbies related to electronics may be helpful.

EDUCATIONAL PROGRAM

253	Engineering Technologies
292	Electrical and Electronics Equipment Repair
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, algebra, geometry, physics, energy and power systems, drafting, electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 17-18, 37, 118, and 143.
Guide for Occupational Exploration (2nd ed., 1984), pp. 127-132, 161-170, and 240-255.
Occupational Outlook Handbook(90-91 ed) p 219
Military Career Guide (1988-89 ed.), p. 78.

SCHOOLS

22316	Central Community College-G I
22501	Central Community College-Hastings
22307	Central Community College-Platte
99804	Gateway Electronics Institute
11959	Hawkeye Institute of Technology
99817	Institute of Computer Science
22803	Metropolitan Community College
22304	Mid-Plains Community College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice
22711	Southeast Community College-Lincoln
22512	Southeast Community College-Milford
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus

3712 INDUSTRIAL ENGINEERING TECHNICIANS

OCCUPATIONAL DESCRIPTION

Industrial engineering technicians help industrial engineers plan the best uses of workers, materials, and machines to produce goods and services. They prepare layouts of machinery and equipment, plan the work flow, do statistical studies, and determine production costs. They also analyze the time and movements a worker needs to complete a task. DOT 012.267-010

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1623	Metallurgical and Materials Engineers
1634	Industrial Engineers
32205	Industrial Designers
3710	Engineering Technologists and Technicians
3713	Mechanical Engineering Technicians
3720	Drafters
4752	Production and Planning Clerks

WORK ACTIVITIES

- Make charts, graphs, and diagrams to show material handling, use of machines, and placement of workers.
- Gather data by watching workers.
- Gather information using stop watch, camera, and recorder.
- Help engineers with development of experimental equipment.
- Inspect equipment during production and recommend changes to improve productivity.
- Help plan work assignments and production schedules.

APTITUDES

- Be able to learn basic engineering principles and the workings of industry.
- Be able to communicate in speaking and writing.
- Have good math abilities and be able to work with precise details.
- Have good space and form perception and average hand and finger dexterity.
- Be able to plan projects, organize and supervise workers, and work as part of a team.
- Be able to make decisions based on data and observations.
- Be interested in working with data and scientific facts and processes.
- Be willing to take on responsibilities.

WORK SETTING

Environment
   Work indoors in offices and production areas; some outdoor work may be necessary.
Hours
   Work 40 hours a week.
Employers
   Manufacturing companies, public utilities, construction companies, and government agencies.

CONSIDERATIONS

- There is opportunity for advancement to specialized areas.
- Technicians may work around noisy machines.

NEBRASKA EMPLOYMENT

About 410 industrial technicians are projected to be employed by 1991.

WAGES

Entry level salaries for industrial engineering technicians vary according to the amount of education completed and experience in specialized areas. In Nebraska, starting salaries range between $15,000 and $25,000 a year. Technicians with a bachelors degree or a two-year degree and experience will command the higher salaries. Nationally, starting salaries tend to parallel those of Nebraska.

EMPLOYMENT GROWTH

Nebraska
   Somewhat Favorable
National
   Favorable
Factors
- Rapid growth in industry and defense expenditures may increase employment in this area.

- Competitive pressures and advancing technology will also add to growth in job opportunities.

PREPARATION

SKILLS

- Knowledge of drafting, basic engineering principles, and business and industry.
- Skills in operating production and drafting equipment.
- Skills in research an data collection.
- Skills in decision making, planning and supervision.
- Skills in report writing and explaining.

LICENSING OR CERTIFICATION

- Licensing is not required but for professional recognition a person may be certified by the Institute for the Certification of Engineering Technicians.
- To be certified, a person must graduate from an approved bachelors or associate degree program in engineering technology or have work experience and pass a qualifying exam.

TRAINING

- Most employers prefer two years of specialized training from technical schools, community colleges, or the military.
- Apprenticeship training is available.
- Previous work experience in industry can be helpful.

EDUCATIONAL PROGRAM

253	Engineering Technologies
287	Industrial Mechanics
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, algebra, geometry, advanced math, manufacturing, energy and power systems, industrial arts, and drafting.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 30.
Guide for Occupational Exploration (2nd ed., 1984), pp. 177-184.
Occupational Outlook Handbook (1990-91 ed.), p. 219.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22214	Western Nebraska Community College-Sidney Campus

3713 MECHANICAL ENGINEERING TECHNICIANS

OCCUPATIONAL DESCRIPTION

Mechanical engineering technicians help engineers in design and development work. They make sketches and rough layouts of machinery and other equipment and parts. They also figure the costs and usefulness of product designs. They often use complex instruments to test new product design. They may estimate labor costs, equipment life, and plant space needed for new operations. Sometimes they work with engineers to solve production problems. DOT 007.161-026

HOLLAND CODE

RIC (Realistic, Investigative, Conventional)

SPECIALTIES

Optomechanical Technicians (007.161-030)
Heat-Transfer Technicians (007.181-010)
Auto-Design Checkers (017.261-010)

NCIS RELATED OCCUPATIONS

1622	Aerospace Engineers
1623	Metallurgical and Materials Engineers
1635	Mechanical Engineers
32205	Industrial Designers
3710	Engineering Technologists and Technicians
3712	Industrial Engineering Technicians
3720	Drafters

WORK ACTIVITIES

- Prepare sketches and layouts using engineers, specifications.
- Check designs and determine costs and material requirements.
- Conduct performance tests on components and systems, evaluate results, and suggest modifications.
- May do troubleshooting and repair work.
- May investigate production flaws to determine causes.
- May do research and design with engineers and scientific staff.

APTITUDES

- Have good verbal abilities for writing and speaking.
- Be able to learn mechanical drafting and to do complex mathematical calculations and to read blueprints.
- Have good space and form perception and hand and finger dexterity.
- Be able to make decisions based on data and observations, do detailed, precise work, and understand technical processes.

WORK SETTING

Environment
  Work indoors in offices, production areas, machine ships, or power plants.
Hours
  Work 40 hours a week.
Employers
  Industrial and manufacturing firms, government agencies, and private consulting firms.

CONSIDERATIONS

- Technicians may be exposed to noise and vibration.

NEBRASKA EMPLOYMENT

About 340 mechanical engineering technicians are projected to be employed by 1991.

WAGES

Entry level salaries for mechanical engineering technicians range between $15,000 and $20,000 a year depending on the amount of education completed as well as the duties and responsibilities of the position. Nationally, salaries are somewhat higher with a range of between $17,400 and $25,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Somewhat Favorable
National
  Favorable
Factors
- Expected growth of research and development funds, expansion of industry, and growth of new areas of engineering such as

environmental protection and alternate energy development should increase the need for technical workers.

PREPARATION

SKILLS

- Knowledge of mechanical drafting and basic engineering procedures and instruments.
- Skills in computer-aided design and basic programming.
- Skills in researching and writing.

LICENSING OR CERTIFICATION

- Licensing is not required but certification by the Institute for the Certification of Engineering Technicians gives professional recognition and increases job opportunities.
- To become certified, a person must graduate from an approved bachelors or associate program in engineering technology or have work experience and pass a qualifying exam.

TRAINING

- Most employers prefer candidates with specialized technical training through correspondence schools, apprenticeship programs, or technical schools and community college programs.
- Training also may be received on the job.

EDUCATIONAL PROGRAM

253	Engineering Technologies
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, advanced math, physics, manufacturing, energy and power systems, drafting and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 23 and 32.

Guide for Occupational Exploration (2nd ed., 1984) pp. 161-170.

Occupational Outlook Handbook(1990-91 ed.), p. 219

SCHOOLS

11959	Hawkeye Institute of Technology
22803	Metropolitan Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

3720 DRAFTERS

OCCUPATIONAL DESCRIPTION

Drafters translate ideas and sketches from engineers, architects, and scientists into detailed drawings which are used in manufacturing and construction. Their duties may include interpreting directions given to them, making sketches, and preparing drawings to scale. Drafters may also calculate the strength, quality, quantity, and cost of materials. They use various drafting tools, engineering practices, and math to complete drawings.

HOLLAND CODE

IRE (Investigative, Realistic, Enterprising)

SPECIALTIES

Architectural Drafters (001.261-010)
Landscape Drafters (001.261-014)
Aeronautical Drafters (002.261-010)
Controls Designers (003.261-014)
Integrated Circuit Layout Designers (003.261-018)
Electrical Drafters (003.281-010)
Electronic Drafters (003.281-014)
Civil Drafters (005.281-010)
Structural Drafters (005.281-014)
Die Designers (007.161-010)
Mechanical Drafters (007.281-010)
Geological Drafters (010.281-014)
Detailers (017.261-018)
Commercial Drafters (017.261-026)
Detail Drafters (017-261-030)
Assistant Drafters (017.281-018)
Automotive Design Drafters (017.281-022)
Technical Illustrators (017.281-034)
Military Drafters (M37200)

NCIS RELATED OCCUPATIONS

1610	Architects
16101	Landscape Architects
1643	Land Surveyors
3250	Painters, Sculptors, Craft-Artists, and Artists-Printmakers
32501	Illustrators
3710	Engineering Technologists and Technicians
3712	Industrial Engineering Technicians
3713	Mechanical Engineering Technicians

WORK ACTIVITIES

- Prepare plans, sketches, and drawings from directions and specifications they are given.
- Complete calculations and write specifications regarding materials needed.
- Estimate the quantity and cost of materials.
- Check the accuracy of completed drawings.
- Assist in ordering supplies.
- Determine work procedures.
- Supervise work of employees under their direction.

APTITUDES

- Be able to learn and apply drafting principles and techniques.
- Have good verbal abilities for reading, writing, and listening.
- Have good math, science, and mechanical abilities.
- Be able to do detailed precision work and concentrate for long periods of time.
- Have good space and form perception, eye-hand coordination, and hand and finger dexterity.
- Be able to make decisions using facts.

WORK SETTING

Environment
Work indoors in offices at drafting tables; usually sitting and rarely moving around.
Hours
Work 40 hours a week; longer hours may be necessary to meet deadlines.
Employers
Manufacturers, engineering and architectural firms, government agencies, construction companies, mining companies.

CONSIDERATIONS

- Job satisfaction may come from using creativity and working with scientific and technical processes.
- Drafters may work under pressure to meet deadlines.
- Most drafters own their own drafting tools.

NEBRASKA EMPLOYMENT

About 1,870 drafters are projected to be employed by 1991.

WAGES

Entry level salaries for drafters with an associate degree range between $15,600 and $21,000 a year in Nebraska. Individuals with specialized training in computer aided design (CAD) and superior talent will earn the higher salaries. Nationally, starting salaries compare favorably with Nebraska with a somewhat expanded range of $15,000 to $28,000 a year. Generally, drafters employed in large cities will command the highest salaries.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors
- This occupation may be affected by changes in the general business cycle.
- Drafters with an associate degree in drafting and trained in the use of computer-aided design systems have the best prospects for jobs.

PREPARATION

SKILLS

- Knowledge of drafting techniques, lettering and linework, use and care of equipment, layout and design of standard drawings, and drafting terms and symbols.
- Knowledge of computer drafting.
- Skills in communication and working with others.
- Skills in reading and following directions.
- Skills in decision making and planning.
- Skills in supervising and giving directions.

TRAINING

- Most employers prefer drafters who have an associate degree from technical schools or community colleges.
- Training is also available in apprenticeship programs.

EDUCATIONAL PROGRAM

131	Architectural and Environmental Design
133	Interior Design
253	Engineering Technologies
291	Drafting
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High school subjects should include courses in composition, advanced math, industrial arts, drafting, geometry, physics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 15-18, 21-23, 26, and 32-33.
Guide for Occupational Exploration (2nd ed., 1984), pp. 176-184.
Occupational Outlook Handbook (1990-91 ed.), p. 217.
Military Career Guide (1988-89 ed.), p. 81.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
11959	Hawkeye Institute of Technology
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
21612	Midland Lutheran College
22304	Mid-Plains Community College
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

3820 BIOLOGICAL TECHNOLOGISTS AND TECHNICIANS

OCCUPATIONAL DESCRIPTION

Biological technologists and technicians work in labs where they perform tests and run experiments to help scientists develop better ways of producing plant and animal products. Their work varies from looking for ways to increase production to trying to improve the quality of natural fibers. Some are involved in animal breeding or the development of new types of seeds. Others study the effects of various feeds on animal growth and health.

HOLLAND CODE

RIC (Realistic, Investigative, Conventional)

SPECIALTIES

Toxicologists (022.081-010)
Dairy Technologists (040.061-022)
Seed Analysts (040.361-014)
Biology Speciman Technicians (041.381-010)
Feed-Research Aides (049.364-010)
Biological Aides (049.384-010)
Tree Surgeons (408.181-010)
Artificial Inseminators (418.384-010)
Artificial-Breeding Technicians (418.384-014)

NCIS RELATED OCCUPATIONS

1854	Biological Scientists
18541	Biochemists
18542	Biologists
18543	Botanists
18545	Plant Pathologists
1855	Medical Scientists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians
5512	General Farmers
5514	Livestock Farmers
5515	Horticultural Farmers

WORK ACTIVITIES

- Conduct experiments to improve handling, processing, and packaging of dairy products.
- Test seeds for germination, purity, and weed content.
- Prepare biological specimens for use as instructional aids.
- Feed rations of experimental feeds to animals and compiles data on growth, productivity, and health of the animals.
- Assist research workers in experiments.
- Prune and treat trees and shrubs to improve their appearance, health, and value.
- Collect and package semen for artificial insemination.
- Inject semen into cows to breed them.

APTITUDES

- Be able to learn the basics of biology and the techniques and procedures of biological research.
- Have good verbal and numerical abilities.
- Be able to make decisions based on data and experience.
- Have average space and form perception, eye-hand coordination, and finger and hand dexterity.
- Be able to keep accurate records.
- Be able to do a variety of tasks.

WORK SETTING

Environment

Work indoors in laboratories and outdoors at testing sites; some jobs may require travel.

Hours

Work 40 hours a week; some hours may be irregular.

Employers

Manufacturers, food processing companies, government agencies, colleges and universities, testing laboratories, feed and seed producers, and artificial breeders.

CONSIDERATIONS

- Workers may be exposed to hazardous substances or conditions.
- Some work as part of a team and others work alone or with little supervision.

NEBRASKA EMPLOYMENT

About 740 biological technologists and technicians are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for biological technologists and technicians with a college degree span a range of between $13,100 and $19,200 a year. Individuals who have earned the bachelors degree may expect earnings at the upper end of the range. Nationally, entry level salaries are somewhat higher than Nebraska with a range of $15,200 to $22,000 a year.

EMPLOYMENT GROWTH

Nebraska
  Unfavorable
National
  Somewhat Favorable
Factors
- More workers are needed in the rapidly growing field of biotechnology research.

PREPARATION

SKILLS

- Knowledge of scientific principles and research techniques and the operation of laboratory and testing equipment.
- Knowledge of math and biology.
- Skills in communication and following directions.
- Skills in recordkeeping and decision making.
- Skills in computer science.

TRAINING

- Most employers prefer applicants who have college training and an associate or bachelors degree.

EDUCATIONAL PROGRAM

111	Agricultural Production
112	Animal Sciences
115	Horticulture and Landscaping
123	Plant Science
124	Agricultural Services
375	Clinical Health Sciences
531	Life Sciences
533	Science Technologies

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, algebra, biology, agriculture, typing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 45, 48, 50, 273, and 279.
Guide for Occupational Exploration (2nd ed., 1984), pp. 118-121, 127-132, and 134-140.
Occupational Outlook Handbook (1990-91 ed.), p. 223.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11958	Florida Institute of Technology
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22414	Nebraska College of Technical Agriculture
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
11954	University of Hawaii at Manoa
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3831 CHEMICAL TECHNOLOGISTS AND TECHNICIANS

OCCUPATIONAL DESCRIPTION

Chemical technologists and technicians help chemists and chemical engineers conduct laboratory tests and measurements to develop chemical based products. Some work in production where they put into operation the processes and the products developed in research labs. They also test materials , processes, and products to make sure they meet standards.

HOLLAND CODE

IRS (Investigative, Realistic, Social)

SPECIALTIES

Colorists (022.161-014)
Perfumers (022.161-018)
Chemical-Laboratory Technicians (022.261-010)
Wastewater Treatment Plant Chemists (022.261-022)
Assayers (022.281-010)
Water Purification Chemists (022.281-014)
Laboratory Testers (022.281-018)
Food Testers (029.361-014)
Military Fuel and Chemical Laboratory Technicians (M38310)

NCIS RELATED OCCUPATIONS

1845	Chemists
3010	Pharmacists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians

WORK ACTIVITIES

- Set up and monitor laboratory equipment and instruments.
- Prepare chemical solutions.
- Record instrument readings and the result of experiments.
- Conduct tests and analyze the chemical content of substances.
- Devise or modify processes and improve production methods.
- Help train operators in processing techniques.
- Test raw materials or products to see they meet specifications.

APTITUDES

- Be able to learn the basics of chemistry and chemical laboratory procedures.
- Have good verbal and numerical abilities.
- Have good space and form and color perception and eye-hand coordination.
- Be able to make decisions based on data and observations.
- Be able to work within set standards and precise measurements.
- Be able to work with others and follow directions.
- Be patient and have accurate work habits.

WORK SETTING

Environment
    Work indoors in labs, offices, and production areas.
Hours
    Work 40 hours a week.
Employers
    Government agencies, industrial firms, laboratories, food processors, research organizations, and colleges and universities.

CONSIDERATIONS

- Workers may be exposed to chemical hazards.

NEBRASKA EMPLOYMENT

About 270 chemical technologists and technicians are projected to be employed by 1991.

WAGES

In Nebraska, entry level salaries for chemical technologists and technicians with a college degree span a range of between $13,100 and $19,200 a year. Individuals who have earned the bachelors degree may expect earnings at the upper end of the range. Nationally, entry level salaries tend to parallel those of Nebraska with a somewhat higher upper range of $24,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable

396

Factors

- New advancements in technical fields plus a continuing emphasis on research and development in science and industry should add to the need for these workers.
- Opportunities will be best for those with specialized training in chemical technology.

PREPARATION

SKILLS

- Knowledge of chemistry and laboratory procedures.
- Skills in using lab equipment and instruments.
- Skills in recording and analyzing results.
- Skills in working with others.

TRAINING

- The minimum educational requirement is usually two or three years of chemistry or chemical technology training in a technical school or community college.
- Bachelors degree programs in chemical engineering technology are available in some schools.
- Most employers provide some on-the-job training for new technicians.

EDUCATIONAL PROGRAM

524 Chemistry

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, algebra, geometry, advanced math, earth science, biology, chemistry, and physics.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 39,40, and 44.
Guide for Occupational Exploration (2nd ed., 1984), pp. 127-132.
Occupational Outlook Handbook (1990-91 ed.), p. 223.
Military Career Guide (1988-89 ed.), p. 84.

SCHOOLS

21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21509	Hastings College
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3890 SCIENCE TECHNOLOGISTS AND TECHNICIANS

OCCUPATIONAL DESCRIPTION

Science technologists and technicians perform tasks to help scientists in lab and production work. They perform lab tests and help collect and study new information. They may inspect, install, repair, or adjust equipment and read meters and gauges. They may collect and record information and write technical reports.

HOLLAND CODE

RIE (Realistic, Investigative, Enterprising)

SPECIALTIES

Air Analysts (012.261-010)
Quality-Control Technicians (012.261-014)
Laser Technicians (019.181-010)
Biomedical Equipment Technicians (019.261-010)
Weather Observers (025.267-014)
Pollution-Control Technicians (029.261-014)
Criminalists (029.281-010)
Laboratory Assistants (029.381-014)
Military Weather Observers (M38900)

NCIS RELATED OCCUPATIONS

1843	Physicists
1846	Meteorologists
1853	Agricultural and Food Scientists
18533	Food Technologists
1854	Biological Scientists
1855	Medical Scientists
18544	Microbiologists
3620	Clinical Laboratory Technologists
3690	Health Technologists and Technicians
36903	Medical Laboratory Technicians
3710	Engineering Technologists and Technicians

WORK ACTIVITIES

- Set up and operate electronic and mechanical equipment.
- Record and report test procedures and results in oral and written forms.
- Make sketches, graphs, and charts to illustrate specific concepts.
- Determine the amount or composition of substances.
- Investigate production or design problems.
- Research new principles or concepts.
- Construct and maintain experimental equipment.

APTITUDES

- Have ability to learn the basics of science and science laboratory procedures.
- Have good verbal and numerical abilities.
- Be able to see detail and space and form relationships.
- Be able to make decisions based on data, observation, and experience.
- Be able to keep accurate records and work to meet set standards.
- Have good eye-hand coordination.

WORK SETTING

Environment

Work indoors in laboratories or production areas; also may work outdoors.

Hours

Work 40 hours a week; may work irregular hours to monitor experiments.

Employers

Manufacturing firms, food processing companies, government agencies, colleges and universities, and testing and research laboratories.

CONSIDERATIONS

- Job offers variety of activities and the opportunity to improve products.
- Workers may be exposed to noise and hazards.
- Job may have high levels of responsibility with potential loss of life and property if mistakes are made.

NEBRASKA EMPLOYMENT

About 36 physical science technicians are projected to be employed by 1991.

WAGES

Entry level salaries for science technologists and technicians vary according to the amount of education completed. In Nebraska, starting salaries range between $13,100 and $19,200. Individuals who have earned a bachelors degree may expect earnings at the upper end of the range. Nationally, salaries tend to parallel those of Nebraska with a somewhat higher upper range of $24,000 a year.

EMPLOYMENT GROWTH

- Nebraska
  - Unfavorable
- National
  - Somewhat Favorable
- Factors
  - The outlook depends on economic conditions, changes in product technology, the level of public and private support for research and development, and public interest in consumer protection and environmental control.

PREPARATION

SKILLS

- Knowledge of scientific principles, research techniques, and operation of laboratory and testing equipment.
- Skills in using computers.
- Skills in making observations and recording data.
- Skills in report writing.

TRAINING

- Most employers prefer applicants with advanced technical training from community colleges or technical schools.
- Some employers prefer applicants with bachelors degree.
- A few employers offer apprenticeship programs or on-the-job training.

EDUCATIONAL PROGRAM

114	Food Sciences
375	Clinical Health Sciences
521	Physical Sciences
523	Meteorology
529	Physics
531	Life Sciences
533	Science Technologies
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, advanced math, earth science, biology, chemistry, physics, manufacturing, typing, data processing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 30, 36, 42, 43, and 44.

Guide for Occupational Exploration (2nd ed., 1984), pp. 127-132 and 342-355.

Occupational Outlook Handbook (1990-91 ed.), p. 223.

Military Career Guide (1988-89 ed.), p. 94.

SCHOOLS

22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
11958	Florida Institute of Technology
21509	Hastings College
11907	Iowa State University
21311	Kearney State College
22402	McCook Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
22601	Nebraska Indian Community College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
11938	St. Louis University
21717	Union College
11954	University of Hawaii at Manoa
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
11955	University of Pittsburgh at Bradford
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3920 AIR TRAFFIC CONTROLLERS

OCCUPATIONAL DESCRIPTION

Air traffic controllers direct and control air traffic while planes and other aircraft take off, land, and are in the air. They keep track of planes flying in their assigned area and talk to the pilots by radio to give them instructions and information. Their first concern is safety, but they also make sure that planes quickly enter and leave the airport to cut down on delays. Some regulate airport traffic while others regulate flights between airports. DOT 193.162-010

HOLLAND CODE

SEC (Social, Enterprising, Conventional)

SPECIALTIES

Station Air-Traffic-Control Specialists (193.162-014)
Tower Air-Traffic-Control Specialists (193.162-018)
Chief Controllers (193.167-010)
Dispatchers (912.167-010)
Military Air Traffic Controllers (M39201)
Military Traffic Control Managers (M39200)

NCIS RELATED OCCUPATIONS

8250 Airplane Pilots and Navigators

WORK ACTIVITIES

- Accept flight plans and relay information to control centers.
- Guide movement of aircraft on the ground.
- Oversee lighting systems and other visual means of traffic control.
- Direct the flight of aircraft within the control area.
- Monitor progress of aircraft making sure they stay at safe distances from each other.
- Maintain contact with pilots to inform them of any factors that may influence their flight.
- Transfer control of aircraft from one control center to another.
- Guide aircraft to landing through radar and radio.

APTITUDES

- Be able to learn Federal Aviation Administration rules and control station or tower procedures.
- Have ability to speak clearly and quickly and give precise directions.
- Be able to make quick, logical decisions based on experience.
- Have good space and form perception.
- Be able to accept responsibility and work under stress.
- Have good hand and finger dexterity.
- Be able to do precise work accurately.
- Be able to concentrate for long periods of time and work under stress.

WORK SETTING

Environment
  Work indoors
Hours
  Work 40 hours a week; may work longer hours and rotating shifts with night and weekend hours.
Employers
  Federal Aviation Administration (FAA)

CONSIDERATIONS

- Work involves responsibility, pressure, and stress.
- College graduates or people who have had civilian or military experience as controllers, pilots, or navigators will have the best opportunity for employment.

NEBRASKA EMPLOYMENT

About 160 air traffic controllers are projected to be employed by 1991.

WAGES

Entry level base pay grade for all air traffic controllers is federal pay grade 7 at $20,195. Entry level salaries are determined by a formula established by the Federal Aviation Administration which takes into account job responsibilities and the complexity of the particular facility. Earnings are higher at facilities where traffic patterns are more complex. Starting salaries at these facilities outside Nebraska start at pay grade 7 and range up to $32,000 a year

EMPLOYMENT OUTLOOK

Nebraska
Favorable
National
Somewhat Favorable
Factors

- The outlook depends on the amount of air traffic, the number of people being trained as controllers, greater use of automated equipment, and replacement of those who leave the occupation.
- The number of applicants is expected to be greater than the number of openings.

PREPARATION

SKILLS

- Knowledge of Federal Aviation Administration regulations, flight service station practices, and weather factors.
- Knowledge of flight plans, navigation techniques, and air traffic control procedures and equipment.
- Skills in establishing priorities and thinking clearly in emergencies.
- Skills in giving oral instructions and maintaining accurate records.

TRAINING

- Air traffic controllers are selected through the Federal Civil Service System.
- An applicant must have three years of general work experience or four years of college or a combination of both.
- Controllers must be less than 31 years of age and pass a written test and physical exam.
- After hiring, sixteen weeks of classroom and on-the-job training is required.
- A performance test is given twice a year and a physical exam is given once a year to all controllers.

EDUCATIONAL PROGRAM

272 Air Transportation

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, speech, geometry, advanced math, physics, typing, electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 140, 141, and 885.
Guide for Occupational Exploration (2nd ed., 1984), pp. 176-184.
Occupational Outlook Handbook (1990-91 ed.), p. 212.
Military Career Guide (1988-89 ed.), pp. 77 and 296.

SCHOOLS

21102	Chadron State College
21810	Embry-Riddle Aeronautical University
21311	Kearney State College
99734	LinAire, Inc.
22304	Mid-Plains Community College
99833	Sky Harbor Air Service, Inc.

3930 RADIO OPERATORS

OCCUPATIONAL DESCRIPTION

Radio operators install, operate, and maintain electronic equipment used to record or transmit radio and television programs or communicate with aircraft, ships, or other ground stations. They work with micro-phones, sound recorders, light and sound effects, television cameras, video recorders, and other equipment.

HOLLAND CODE

RCE (Realistic, Conventional, Enterprising)

SPECIALTIES

Airline-Radio Operators (193.262.010)
Dispatchers (193.262-014)
Field Engineers (193.262-018)
Radiotelegraph Operators (193.262-030)
Radiotelephone Operators (193.262-034)
Transmitter Operators (193.262-038)
Audio Operators (194.262-010)
Video Operators (194.282-010)
Military Radio Operators (M39300)
Military Radio Intelligence Operators (M39301)

NCIS RELATED OCCUPATIONS

1341	Communications Operations Managers
3711	Electrical and Electronic Engineering Technicians
6151	Communications Equipment Repairers

WORK ACTIVITIES

- Operate transmitting equipment and perform adjustments.
- Maintain and repair electronic equipment.
- Maintain the tone, quality, and volume of sound.
- Adjust brightness, contrast, and other characteristics of the picture portion of television programs.
- Monitor and log outgoing signals.
- Regulate sound pick-up, transmission, and switching.
- Set up and operate broadcasting equipment.

APTITUDES

- Have ability to learn the basics of radio and broadcast equipment operation and maintenance.
- Have good numerical and verbal abilities.
- Be able to visualize objects from drawings and pictures, see detail, and see differences in colors.
- Have good hand and finger dexterity and eye-hand coordination.
- Be able to make decisions based on data and observation, work within precise standards and time limits, and work under pressure.

WORK SETTING

Environment
Work indoors or outdoors in the field.
Hours
Work 40 hours a week with possible evening, night, or weekend hours; may work longer hours to meet deadlines.
Employers
Radio and television stations, motion picture companies, and airline companies.

CONSIDERATIONS

- Most jobs will be large metropolitan areas.
- Job may require long periods of sitting and operators may occasionally be exposed to electrical shocks.

NEBRASKA EMPLOYMENT

About 70 radio operators are projected to be employed by 1991.

WAGES

Starting salaries for radio operators vary according to the amount and type of education or training completed as well as the size and geographic location of the employer. In Nebraska, entry level salaries span a broad range of $10,000 to $22,000 a year. High school graduates with no experience who enter employment as a trainee will receive salaries at the lower end of the scale. Graduates of accredited electronics or broadcast technology programs may expect salaries at the upper end of the scale. Nationally, starting salaries are somewhat higher than Nebraska with a range of $11,000 to $27,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Favorable
National
    Somewhat Favorable
Factors

- More new stations plus the expansion of cable television will generate more opportunities.
- A surplus of qualified operators and the increasing use of automated equipment may limit opportunities.
- In metropolitan areas, people seeking beginning jobs face strong competition.
- In Nebraska, the employment outlook may be very favorable, but this is a small occupational group.

PREPARATION

SKILLS

- Knowledge of broadcast equipment and electronics principles.
- Knowledge of Federal Communications Commission regulations and practices.
- Skills in operating and repairing equipment.

LICENSING OR CERTIFICATION

- All radio operators working radio or television transmitters are required to hold a restricted radiotelephone operators permit for which no exam is required.
- People who work with microwave or other internal radio communications equipment must have a general radiotelephone operators license from the Federal Communications Commission that is issued after they pass a series of written exams.

TRAINING

- Most employers prefer people with one or two years of training in electronics or broadcast technology.
- Some employers hire applicants who are high school graduates and then provide on-the-job training.
- Apprenticeship training is available is some areas.

EDUCATIONAL PROGRAM

196	Communications Technology
292	Electrical and Electronics Equipment Repair
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

High School subjects should include courses in advanced math, physics, media production, electronics, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 141-142.
Guide for Occupational Exploration (2nd ed., 1984), pp. 176-184 and 240-255.
Occupational Outlook Handbook (1990-91 ed.), pp. 339
Military Career Guide (1988-89 ed.), pp. 90 and 91.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21803	College of Saint Mary
99804	Gateway Electronics Institute
99817	Institute of Computer Science
22803	Metropolitan Community College
22304	Mid-Plains Community College
22306	Northeast Community College
22708	Southeast Community College-Beatrice Campus
22512	Southeast Community College-Milford Campus
22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus

3960 LEGAL TECHNICIANS

OCCUPATIONAL DESCRIPTION

Legal technicians assist lawyers and others in the legal field. They do such things as search for public records and prepare lists of summaries of legal documents. Some study papers to see if they meet legal requirements. Others hold funds and records until legal contracts are fulfilled. Sometimes they help lawyers prepare drafts of legal documents such as briefs, wills, contracts, deeds, or patent applications.

HOLLAND CODE

SCE (Social, Conventional, Enterprising)

SPECIALTIES

Patent Agents (119.167-014)
Abstractors (119.267-010)
Contract Clerks (119.267-018)
Legal Investigators (119.267-022)
Paralegal Assistants (119.267-026)
Title Examiners (119.287-010)
Escrow Officers (119.367-010)
Title Clerks (162.267-010)
Title Searchers (209.367-046)
Military Legal Technicians (M39600)

NCIS RELATED OCCUPATIONS

2110	Lawyers
2120	Judges

WORK ACTIVITIES

- Research and interpret law sources.
- Interview witnesses an clients.
- Appraise and inventory real and personal property for estate planning.
- Investigate facts and law of cases to decide causes of action.
- Prepare cases.
- File pleadings with court clerk, prepare affidavits, and deliver subpoenas.
- Supervise work of law office employees.
- Prepare office accounts and tax returns.

APTITUDES

- Be able to learn the principles and practices of law and legal assisting.
- Have strong verbal abilities.
- Have good math and clerical abilities.
- Be able to handle a variety of tasks and work within set standards.
- Be able to make decisions based on data.
- Have ability to work with a variety of people.
- Be able to follow directions and work under pressure.

WORK SETTING

Environment
Work indoors in offices and courtrooms.
Hours
Work 40 hours a week with longer possible hours.
Employers
Law firms, government agencies, corporations, legal clinics, banks, title companies, professional trade companies, and legal assistance offices.

CONSIDERATIONS

- Legal technicians may work along or as part of a team.
- Job requires long periods of sitting.
- Workers often use computers for word processing and locating information.

NEBRASKA EMPLOYMENT

About 1,230 legal assistants and technicians are projected to be employed by 1991.

WAGES

Starting salaries for legal technicians vary according to the amount and type of education or training completed as well as the size and geographic location of the employer. In Nebraska, entry level salaries span a broad range of between $12,000 and $22,000 a year. Individuals employed as a trainee or apprentice will start at the lower end of the scale. Graduates of paralegal programs or equivalent programs of study may expect salaries in the upper range. Salaries will also vary according to the specialized training for which the legal assistant is prepared. Nationally, salaries compare favorably with Nebraska with a slightly higher upper range of $24,000 a year.

EMPLOYMENT GROWTH

Nebraska
Favorable
National
Favorable
Factors

- Increasing awareness among lawyers of the value of legal technicians should open many new jobs.
- Prepaid legal insurance plans and increased consumer demand for low-cost legal services have increased opportunities.
- Competition will increase as the number of graduates from training programs increases.

PREPARATION

SKILLS

- Knowledge of law, legal terms, procedures, and documents.
- Knowledge of research methods and investigation and interview techniques.
- Skills in clerical activities.
- Skills in analytical thinking.
- Skills in writing and presenting research findings.

LICENSING OR CERTIFICATION

- Paralegal assistants may gain professional recognition by becoming certified by the Certifying Board of Legal Assistants. Certification is currently voluntary.
- To be certified, a person must pass a comprehensive test and meet standards set by the National Association of Legal Assistants.

TRAINING

- Most employers prefer graduates of a community college program or those with a four-year degree who have related work experience.
- Some require one year of law school.
- Some employers promote legal secretaries to legal technicians and provide on-the-job training for them.
- Apprenticeship training is another way to become a legal technician.

EDUCATIONAL PROGRAM

158	Secretarial Programs
421	Law
422	Legal Assisting
631	Apprenticeship Training
632	On-the-Job Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, government, sociology, psychology, accounting, office education, typing, data processing, and business law.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), pp. 76 and 172.
Guide for Occupational Exploration (2nd ed., 1984), pp. 536-539.
Occupational Outlook Handbook (1990-91 ed.), p. 221.
Military Career Guide (1988-89 ed.), p. 86.

SCHOOLS

22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21808	Grace College of the Bible
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21325	Nebraska Christian College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
99830	Omaha Opportunities Industrialization Center, Inc.
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
44301	Spencer School of Business
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College

22205	Western Nebraska Community College-Scottsbluff Campus
22214	Western Nebraska Community College-Sidney Campus
44805	Word Processing and Secretarial College
22517	York College

3971 COMPUTER PROGRAMMERS

OCCUPATIONAL DESCRIPTION

Computer programmers write programs and other instructions that tell computers to perform specific tasks. Programs are detailed instructions that list steps machines must follow to organize data, solve problems, or do other tasks. They break each step into a series of coded instructions, using one of the languages developed for computers. They test the programs and then prepare instruction sheets for workers to use in running them.

HOLLAND CODE

CIR (Conventional, Investigative, Realistic)

SPECIALTIES

Business Programmers	(020.162-014)
Chief Business Programmers	(020.167-018)
Information System Programmers	(020.187-010)
Software Technicians	(020.262-010)
Military Computer Programmers	(M39710)

NCIS RELATED OCCUPATIONS

1712	Computer Systems Analysts
1733	Statisticians
4612	Computer Operators

WORK ACTIVITIES

- Analyze and study data on the problem.
- Prepare a plan or flowchart to solve the problem.
- Write detailed coded instructions for the computer to follow.
- Test program to make sure it works.
- Write instructions to guide workers during production runs.
- Make reports of program development.

APTITUDES

- Be able to learn the principles and processes of computer programming.
- Have strong verbal and numerical abilities.
- Be able to pay attention to detail and do precise work.
- Be able to make decisions based on data.
- Have ability to do work that requires abstract thinking.
- Be able to visualize objects from drawings and pictures.
- Be able to work with people.

WORK SETTING

Environment
    Work indoors in offices or computer rooms.
Hours
    Work 40 hours a week with longer hours possible to meet deadlines.
Employers
    Manufacturing companies, banks, insurance companies, government agencies, colleges and universities, public utilities, computing services, research organizations, and wholesale and retail businesses.

CONSIDERATIONS

- Work requires long hours of concentration.
- Computer programming requires constant updating of skills through study and on-the-job training.
- Workers may experience periods of stress due to technical difficulties and time limits.

NEBRASKA EMPLOYMENT

About 2,950 computer programmers are projected to be employed by 1991.

WAGES

Entry level salaries for computer programmers range between $21,200 and $30,576 a year. Programmers with a bachelors degree and little or no experience will start at the lower end of the scale. Programmmers with a masters degree will start at the upper end of the scale. Salaries will also vary according to the size and geographic location of the employer. Nationally, salaries compare favorably with Nebraska with a slightly expanded range of $19,000 to $32,000 a year.

EMPLOYMENT GROWTH

Nebraska
    Unfavorable
National
    Favorable

Factors

- The outlook depends on expanded use of computers and advances in computer hardware, software, and programming techniques.
- Greater use of packaged software that can meet the needs of many users could limit the use of programmers.
- Prospects are best for those who have a bachelors degree and are familiar with a variety of programming languages.

PREPARATION

SKILLS

- Knowledge of complex math and computer science and languages.
- Skills in analyzing data.
- Skills in communicating technical information.
- Skills in organizing time and information.
- Skills in working with other workers and clients.

LICENSING OR CERTIFICATION

- Licensing is not required, but to gain professional recognition, a person may be certified by the Institute for Certification of Computer Professionals.
- To be certified a person must pass a five-part exam offered by the institute.
- Individuals may take another section of the exam in order to specialize in business, scientific, or systems applications.

TRAINING

- Most employers require a bachelors degree in computer science or a closely related field.
- Some require a masters degree in computer science.
- Another option is a degree in a particular science or business field with course work in computer science.
- Some employers offer apprenticeship training programs.

EDUCATIONAL PROGRAM

211	Computer and Information Sciences
481	Mathematics
631	Apprenticeship Training

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, algebra, geometry, advanced math, data processing, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 38.

Guide for Occupational Exploration (2nd ed., 1984), pp. 524-526.

Occupational Outlook Handbook (1990-91 ed.), p. 215.

Military Career Guide (1988-89 ed.), p. 79.

SCHOOLS

21801	Bellevue College
22316	Central Community College-Grand Island Campus
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
21810	Embry-Riddle Aeronautical University
21509	Hastings College
99817	Institute of Computer Science
21311	Kearney State College
22718	Lincoln School of Commerce
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
44802	Nebraska College of Business
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
21821	University of Nebraska at Omaha
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus
22517	York College

3980 TECHNICAL WRITERS

OCCUPATIONAL DESCRIPTION

Technical writers research, write, and edit technical materials. They put technical information into language that is easily understood. They study reports, blueprints, and other technical matter and talk with engineers or scientists to get information. They use this information to write manuals, training materials, and research reports. They also write proposals to get money to conduct projects, develop products, or do research. A few write speeches and news releases. They also may prepare tables, charts, and artwork for publication. DOT 131.267-026

HOLLAND CODE

IRS (Investigative, Realistic, Social)

NCIS RELATED OCCUPATIONS

3210	Authors
3313	Reporters

WORK ACTIVITIES

- Gather information from personal observations, written data, and interviews.
- Organize the information in logical sequence.
- Prepare rough draft and rewrite it until it is considered satisfactory.
- Make recommendations on the drawings, diagrams, charts, and illustrations to accompany the text.
- Submit copy to editorial supervisor and appropriate scientists and engineers for approval.
- May help lay out material for publishing.

APTITUDES

- Be able to learn technical specialties, writing techniques, and printing and layout processes.
- Have high verbal abilities.
- Be able to visualize objects from pictures and drawings.
- Be able to make judgments based on data and observations.
- Be able to work with a variety of subjects.
- Be able to organize ideas and communicate clearly with others.

WORK SETTING

Environment

Work in offices, libraries, research centers, or factories; some travel may be required to gather information.

Hours

Work 40 hours a week; longer hours may be required to meet deadlines or complete special projects.

Employers

Government agencies, colleges and universities, research centers, publishing firms, manufacturers, computer companies, medical and drug supply companies, business corporations, financial institutions, utilities, and self-employed.

CONSIDERATIONS

- Writers usually work alone and concentrate for long periods of time.

NEBRASKA EMPLOYMENT

About 100 technical writers are projected to be employed by 1991.

WAGES

Starting salaries for technical writers range between $16,000 and $21,000 a year in Nebraska. Nationally, salaries compare favorably with a somewhat expanded range of $15,000 to $25,000 a year.

EMPLOYMENT GROWTH

Nebraska

Favorable

National

Favorable

Factors

- The demand for technical writers is increasing because of the greater volume of technical and scientific information which needs to be communicated to lay people.
- Opportunities are best for those who have writing skills and technical knowledge.

PREPARATION

SKILLS

- Knowledge of a specific scientific and technical area.
- Knowledge of writing techniques, graphics, and publication production.
- Skills in writing that are well developed.
- Skills in interviewing and researching.
- Skills in planning and organizing work.
- Skills in using computers.

TRAINING

- The minimum educational requirement is a bachelors degree in a technical field, journalism, or English.
- One route of preparation is to get a degree in English, journalism, or technical communications and to take courses in a specific technical field.
- The other option is to major in a technical field and to take courses in English, journalism, and technical communication.

EDUCATIONAL PROGRAM

193	Journalism and Communications
253	Engineering Technologies
441	English
521	Physical Sciences
533	Science Technologies

HELPFUL HIGH SCHOOL SUBJECTS

Follow a college preparatory curriculum including courses in composition, journalism, geometry, advanced math, earth science, biology, chemistry, phyisics, media production, data processing, commercial and graphic art, drafting, and computer science.

BIBLIOGRAPHY

Dictionary of Occupational Titles (4th ed., 1977), p. 78.
Guide for Occupational Exploration (2nd ed., 1984), pp. 554-557.
Occupational Outlook Handbook (1990-91 ed.), p. 173.

SCHOOLS

21801	Bellevue College
22501	Central Community College-Hastings Campus
22307	Central Community College-Platte Campus
21102	Chadron State College
21803	College of Saint Mary
21504	Concordia College
21805	Creighton University
21606	Dana College
21507	Doane College
11958	Florida Institute of Technology
21808	Grace College of the Bible
21509	Hastings College
11959	Hawkeye Institute of Technology
99817	Institute of Computer Science
21311	Kearney State College
22402	McCook Community College
22803	Metropolitan Community College
22304	Mid-Plains Community College
21612	Midland Lutheran College
21714	Nebraska Wesleyan University
22306	Northeast Community College
21715	Peru State College
22708	Southeast Community College-Beatrice Campus
22711	Southeast Community College-Lincoln Campus
22512	Southeast Community College-Milford Campus
21717	Union College
11954	University of Hawaii at Manoa
21821	University of Nebraska at Omaha
21819	University of Nebraska Medical Center
21718	University of Nebraska-Lincoln
21622	Wayne State College
22205	Western Nebraska Community College-Scottsbluff Campus

WAGE TABLE

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WAGE TABLE

Annual wages are determined by multiplying the hourly wage by 2,080 hours. **Monthly** wages are determined by dividing the annual wage by twelve. **Weekly** wages are determined by dividing the annual wage by fifty-two.

Hourly	Weekly	Monthly	Annual	Hourly	Weekly	Monthly	Annual
$ 2.00	$ 80	$ 346	$ 4160	6.00	240	1039	12480
2.10	84	364	4368	6.10	244	1057	12688
2.20	88	381	4576	6.20	248	1074	12896
2.30	92	398	4784	6.30	252	1091	13104
2.40	96	416	4992	6.40	256	1108	13312
2.50	100	433	5200	6.50	260	1126	13520
2.60	104	450	5408	6.60	264	1143	13728
2.70	108	468	5616	6.70	268	1160	13936
2.80	112	485	5824	6.80	272	1178	14144
2.90	116	502	6032	6.90	276	1195	14352
3.00	120	520	6240	7.00	280	1212	14560
3.10	124	537	6448	7.10	284	1230	14768
3.20	128	554	6656	7.20	288	1247	14976
3.30	132	572	6864	7.30	292	1264	15184
3.40	136	589	7072	7.40	296	1282	15392
3.50	140	606	7280	7.50	300	1299	15600
3.60	144	624	7488	7.60	304	1316	15808
3.70	148	641	7696	7.70	308	1334	16016
3.80	152	658	7904	7.80	312	1351	16224
3.90	156	675	8112	7.90	316	1368	16432
4.00	160	693	8320	8.00	320	1386	16640
4.10	164	710	8528	8.10	324	1403	16848
4.20	168	727	8736	8.20	328	1420	17056
4.30	172	745	8944	8.30	332	1438	17264
4.40	176	762	9152	8.40	336	1455	17472
4.50	180	779	9360	8.50	340	1472	17680
4.60	184	797	9568	8.60	344	1490	17888
4.70	188	814	9776	8.70	348	1507	18096
4.80	192	831	9984	8.80	352	1524	18304
4.90	196	849	10192	8.90	356	1541	18512
5.00	200	866	10400	9.00	360	1559	18720
5.10	204	883	10608	9.10	364	1576	18928
5.20	208	901	10816	9.20	368	1593	19136
5.30	212	918	11024	9.30	372	1611	19344
5.40	216	935	11232	9.40	376	1628	19552
5.50	220	953	11440	9.50	380	1645	19760
5.60	224	970	11648	9.60	384	1663	19968
5.70	228	987	11856	9.70	388	1680	20176
5.80	232	1005	12064	9.80	392	1697	20384
5.90	236	1022	12272	9.90	396	1715	20592

Hourly	Weekly	Monthly	Annual
10.00	400	1732	20800
10.10	404	1749	21008
10.20	408	1767	21216
10.30	412	1784	21424
10.40	416	1801	21632
10.50	420	1819	21840
10.60	424	1836	22048
10.70	428	1853	22256
10.80	432	1871	22464
10.90	436	1888	22672
11.00	440	1905	22880
11.10	444	1923	23088
11.20	448	1940	23296
11.30	452	1957	23504
11.40	456	1974	23712
11.50	460	1992	23920
11.60	464	2009	24128
11.70	468	2026	24336
11.80	472	2044	24544
11.90	476	2061	24752
12.00	480	2078	24960
12.10	484	2096	25168
12.20	488	2113	25376
12.30	492	2130	25584
12.40	496	2148	25792
12.50	500	2165	26000
12.60	504	2182	26208
12.70	508	2200	26416
12.80	512	2217	26624
12.90	516	2234	26832
13.00	520	2252	27040
13.10	524	2269	27248
13.20	528	2286	27456
13.30	532	2304	27664
13.40	536	2321	27872
13.50	540	2338	28080
13.60	544	2356	28288
13.70	548	2373	28496
13.80	552	2390	28704
13.90	556	2407	28912
14.00	560	2425	29120
14.10	564	2442	29328
14.20	568	2459	29536
14.30	572	2477	29744
14.40	576	2494	29952
14.50	580	2511	30160
14.60	584	2528	30368
14.70	588	2546	30576
14.80	592	2563	30784
14.90	596	2581	30992
15.00	600	2598	31200
15.10	604	2615	31408
15.20	608	2633	31616
15.30	612	2650	31824
15.40	616	2667	32032
15.50	620	2685	32240
15.60	624	2702	32448
15.70	628	2719	32656
15.80	632	2737	32864
15.90	636	2754	33072
16.00	640	2771	33280
16.10	644	2789	33488
16.20	648	2806	33696
16.30	652	2823	33904
16.40	656	2840	34112
16.50	660	2858	34320
16.60	664	2875	34528
16.70	668	2892	34736
16.80	672	2910	34944
16.90	676	2927	35152
17.00	680	2944	35360
17.10	684	2962	35568
17.20	688	2979	35776
17.30	692	2996	35984
17.40	696	3014	36192
17.50	700	3031	36400
17.60	704	3048	36608
17.70	708	3066	36816
17.80	712	3083	37024
17.90	716	3100	37232
18.00	720	3118	37440
18.10	724	3135	37648
18.20	728	3152	37856
18.30	732	3170	38064
18.40	736	3187	38272
18.50	740	3204	38480
18.60	744	3222	38688
18.70	748	3239	38896
18.80	752	3256	39104
18.90	756	3273	39312
19.00	760	3291	39520
19.10	764	3308	39728
19.20	768	3325	39936
19.30	772	3343	40144
19.40	776	3360	40352

Hourly	Weekly	Monthly	Annual
19.50	780	3377	40560
19.60	784	3395	40768
19.70	788	3412	40976
19.80	792	3429	41184
19.90	796	3447	41392
20.00	800	3467	41600
20.10	804	3484	41808
20.20	808	3501	42016
20.30	812	3519	42224
20.40	816	3536	42432
20.50	820	3553	42640
20.60	824	3571	42848
20.70	828	3588	43056
20.80	832	3605	43264
20.90	836	3623	43472
21.00	840	3640	43680
21.10	844	3657	43888
21.20	848	3675	44096
21.30	852	3692	44304
21.40	856	3709	44512
21.50	860	3727	44720
21.60	864	3744	44928
21.70	868	3761	45136
21.80	872	3779	45344
21.90	876	3796	45552
22.00	880	3813	45760
22.10	884	3831	45968
22.20	888	3848	46176
22.30	892	3865	46384
22.40	896	3883	46592
22.50	900	3900	46800
22.60	904	3917	47008
22.70	908	3935	47216
22.80	912	3952	47424
22.90	916	3969	47632
23.00	920	3987	47840
23.10	924	4004	48048
23.20	928	4021	48256
23.30	932	4039	48464
23.40	936	4056	48672
23.50	940	4073	48880
23.60	944	4091	49088
23.70	948	4108	49296
23.80	952	4125	49504
23.90	956	4143	49712
24.00	960	4160	49920
24.10	964	4177	50128
24.20	968	4195	50336
24.30	972	4212	50544
24.40	976	4229	50752
24.50	980	4247	50960
24.60	984	4264	51168
24.70	988	4281	51376
24.80	992	4299	51584
24.90	996	4316	51792
25.00	1000	4333	52000
25.10	1004	4351	52208
25.20	1008	4368	52416
25.30	1012	4385	52624
25.40	1016	4403	52832
25.50	1020	4420	53040
25.60	1024	4437	53248
25.70	1028	4455	53456
25.80	1032	4472	53664
25.90	1036	4489	53872
26.00	1040	4507	54080
26.10	1044	4524	54288
26.20	1048	4541	54496
26.30	1052	4557	54704
26.40	1056	4576	54912
26.50	1060	4593	55120
26.60	1064	4611	55328
26.70	1068	4628	55536
26.80	1072	4645	55744
26.90	1076	4663	55952
27.00	1080	4680	56160
27.10	1084	4697	56368
27.20	1088	4715	56576
27.30	1092	4732	56784
27.40	1096	4749	56992
27.50	1100	4767	57200
27.60	1104	4784	57408
27.70	1108	4801	57616
27.80	1112	4819	57824
27.90	1116	4836	58032
28.00	1120	4853	58240
28.10	1124	4871	58448
28.20	1128	4888	58656
28.30	1132	4905	58864
28.40	1136	4923	59072
28.50	1140	4940	59280
28.60	1144	4957	59488
28.70	1148	4975	59696
28.80	1152	4992	59904
28.90	1156	5009	60112

Hourly	Weekly	Monthly	Annual
29.00	1160	5027	60320
29.10	1164	5044	60528
29.20	1165	5061	60736
29.30	1172	5079	60944
29.40	1176	5096	61152
29.50	1180	5113	61360
29.60	1184	5131	61568
29.70	1188	5148	61776
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29.90	1196	5183	62192

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7339	FABRICATING MACHINE SETUP OPERATORS
1635	Facilities Mechanical-Design Engineers
2610	Family Practitioners
4230	Farm & Garden Equipment & Supplies Sales Repres.
6118	FARM EQUIPMENT MECHANICS
1443	FARM PRODUCTS PURCHASING AGENTS
5612	FARM WORKERS
6118	Farm-Equipment Mechanics II
3250	Fashion Artists
32501	Fashion Artists
13512	Fast Food Service Managers
1351	Fast Food Services Managers
5216	Fast-Food Workers
1101	Federal Aid Coordinators
7664	Feed Mixers
7662	Feed Weighers
8618	Feed-Mixer Helpers
3820	Feed-Research Aides
6479	Fence Erectors
6115	Fiberglass Auto-Body Repairers
1449	Field Contractors
6153	Field Engineers
3930	Field Engineers
5515	Field Horticulture-Specialty Growers
1250	Field Representatives
6178	Field Service Technicians
1449	Field-Contact Technicians
1622	Field-Service Engineers
4696	FILE CLERKS
4696	File Clerks I
4696	File Clerks II
1733	Financial Analysts
1220	Financial Institution Managers
1210	Financial Institution Presidents
1220	Financial Institution Treasurers
1220	Financial Institution Vice Presidents
1220	FINANCIAL MANAGERS
4124	Financial Services Sales Agents
1281	Financial-Aid Officers
4124	Financial-Report Service Sales Agents
5253	Fingernail Formers
3260	Finish Photographers
1101	Fire Chiefs
5123	FIRE FIGHTERS
1634	Fire-Protection Engineers
6412	Firebrick and Refractory Tile Bricklayers
5134	Fish and Game Wardens
5514	Fish Farmers
7512	Fittings Finishers
8250	Flight Engineers
4340	Floor Coverings Salespersons
6462	Floor Layers
3220	Floral Designers
32206	FLORAL DESIGNERS
8618	Flour-Blender Helpers
8250	Flying Instructors I
8769	Folders
4364	Food and Beverage Order Clerks
1473	Food and Drug Inspectors
1845	Food Chemists
4030	Food Concession Managers
5219	Food Order Expediters
1320	Food Processing Plant Managers
4240	Food Products Sales Representatives
4362	Food Sales Clerks
1351	FOOD SERVICE AND LODGING MANAGERS
13512	Food Service Directors
1351	Food Service Directors
1351	Food Service Managers
13512	FOOD SERVICE MANAGERS
1853	Food Technologists
18533	FOOD TECHNOLOGISTS

3831	Food Testers
8214	Food-Service Drivers
2401	Foreign-Student Advisers
1852	Forest Ecologists
18521	Forest Ecologists
5720	Forest Products Gathers
5123	Forest-Fire Fighters
5720	Forester Aides
1852	Foresters
18521	FORESTERS
1852	FORESTRY AND SOIL CONSERVATION SCIENTISTS
5720	FORESTRY WORKERS
6422	Form Builders
5213	Formal Waiters/Waitresses
5060	Foster Parents
4230	Foundry and Machine Shop Products Sales Repres.
1823	Foundry Metallurgists
8769	Foundry Workers
87691	FOUNDRY WORKERS
5216	Fountain Servers
6115	Frame Straighteners
8726	FREIGHT, STOCK, AND MATERIAL MOVERS
6172	Fretted-Instrument Repairers
1351	Front Office Managers
13511	Front Office Managers
8318	Front-End Loader Operators
5246	Fumigators
4366	Fund Raisers
8216	Funeral Car Chauffeurs
13591	FUNERAL DIRECTORS
1359	Funeral Directors
5514	Fur Farmers
8618	Furnace Helpers
6450	Furnace Installers
7544	Furnace Operators
6835	FURNITURE FINISHERS
4340	Furniture Salespersons
6853	Furniture Upholsterers
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8730	GARAGE AND SERVICE STATION ATTENDANTS
8213	Garbage Collector Drivers
8722	GARBAGE COLLECTORS
1473	Gas Inspectors
7714	Gas Welders
8730	Gas-and-Oil Servicers
6931	Gas-Engine Operators
6114	Gas-Engine Repairers
6450	Gas-Meter Installers
4644	Gate Agents
1919	Genealogists
2901	General Duty Nurses
5512	GENERAL FARMERS
5612	General Farmworkers I
5612	General Farmworkers II
4340	General Hardware Salespersons
7820	General Inspectors
8769	General Laborers
7339	General Machine Operators
1210	GENERAL MANAGERS
4240	General Merchandise Sales Representatives
4340	General Merchandise Salespersons
4630	GENERAL OFFICE CLERKS
2610	General Practitioners
1320	General Supervisors
4712	General-Ledger Bookkeepers
1854	Geneticists
3720	Geological Drafters
1847	GEOLOGISTS
1847	Geophysical Prospectors
1847	Geophysicists
5236	Geriatric Nurse Assistants
6115	Glass Installers
6442	Glass Tinters
8618	Glass-Cutter Helpers
6464	GLAZIERS
1352	Golf Club Managers
1472	Grade Checkers
1443	Grain Broker-and-Market Operators
1443	Grain Buyers
4753	Grain Elevator Clerks
7101	GRAIN ELEVATOR SUPERINTENDENTS
7840	Grain Receivers
4153	Graphic Art Sales Representatives
3220	Graphic Designers
32201	GRAPHIC DESIGNERS
8650	Gravity Prospecting Observer Helpers
5622	Greenskeepers II
8769	Grinding and Polishing Laborers
5257	Ground Hosts/Hostesses
5622	GROUNDSKEEPERS AND GARDENERS
2032	Group Workers
5144	GUARDS
1352	Gun Club Managers
2610	Gynecologists
26102	GYNECOLOGISTS
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5253	Hair Stylists
5253	HAIRDRESSERS AND COSMETOLOGISTS
8761	Hand Bander
7753	HAND CUTTING AND TRIMMING WORKERS
7658	Hand Launderers
8761	Hand Packagers
8761	HAND PACKERS AND PACKAGERS
7657	Hat Blockers
3401	Head Coaches
2901	Head Nurses
7633	Head Sawyers
5233	HEALTH AIDES
1473	Health Care Facilities Inspectors
1843	Health Physicists
3640	HEALTH RECORD TECHNICIANS
3690	HEALTH TECHNOLOGISTS AND TECHNICIANS
2120	Hearing Officers
6171	Hearing-Aid Repairers
6116	Heat and Vent Aircraft Mechanics
3713	Heat-Transfer Technicians
6160	HEATING, AIR-CONDITIONING, AND REFRIGERATION MECHANICS
1472	Heating and Refrigeration Inspectors
7544	HEATING EQUIPMENT OPERATORS
6117	HEAVY EQUIPMENT MECHANICS
8213	Heavy Truck Drivers
8213	HEAVY TRUCK DRIVERS
8250	Helicopter Pilots
4152	Herbicide Service Sales Representatives
6479	Highway Maintenance Workers
5132	Highway Patrol Pilots
1855	Histopathologists

1919	Historians
2520	Historic Sites Supervisors
4240	Hobbies and Crafts Sales Representatives
5514	Hog-Confinement-System Managers
5236	Home Attendants
2390	Home Economists
23902	HOME ECONOMISTS
3690	Home Health Technicians
2350	Home Therapy Teachers
6155	HOME-ENTERTAINMENT EQUIPMENT REPAIRERS
3401	Horse Exercisers
5617	Horse Trainers
5624	Horseshoers
4340	Horticultural and Nursery Products Salespersons
5515	HORTICULTURAL FARMERS
1853	Horticulturists
1210	Hospital Administrators
12102	HOSPITAL ADMINISTRATORS
5242	Hospital Cleaners
5216	Hospital Food-Service Workers
4642	Hospital-Admitting Clerks
1430	Hospital-Insurance Representatives
8212	Hostlers
6160	Hot Air Furnace Installer-and-Repairers
8769	Hot Air Furnace-Installer-and-Repairer Helpers
4240	Hotel & Restaurant Eq. & Supplies Sales Represent.
1351	Hotel and Motel Managers
4643	HOTEL CLERKS
13511	HOTEL OR MOTEL MANAGERS
13511	Hotel Recreational Facilities Managers
6479	House Builders
6479	House Movers
5144	House Officers
6422	House Repairers
5242	Housecleaners
6156	HOUSEHOLD APPLIANCE REPAIRERS
4340	Household Appliances Salespersons
5242	HOUSEKEEPING CLEANERS
1353	Housing Project Managers
2032	Human Relations or Drug and Alcohol Counselors
1430	Human Resource Advisors
1628	Hydraulic Engineers
6932	Hydroelectric Station Operators
1847	Hydrologists
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8618	Ice Cream Freezer Assistants
3250	Illustrators
32501	ILLUSTRATORS
4753	Incoming-Freight Clerks
	INDEX
5244	Industrial Cleaners
3220	Industrial Designers
32205	INDUSTRIAL DESIGNERS
3712	INDUSTRIAL ENGINEERING TECHNICIANS
1634	INDUSTRIAL ENGINEERS
6867	Industrial Equipment Assemblers and Wirers
3690	Industrial Hygienists
1210	Industrial Organization Managers
1320	INDUSTRIAL PRODUCTION MANAGERS
1230	Industrial Relations Directors
3032	Industrial Therapists
6112	Industrial Truck Mechanics
8318	INDUSTRIAL TRUCK OPERATORS
5622	Industrial-Commercial Groundskeepers

8730	Industrial-Garage Servicers
1634	Industrial-Health Engineers
1915	Industrial-Organizational Psychologists
1473	Industrial-Safety-and-Health Technicians
8318	Industrial-Truck Operators
4340	Infants' and Children's Wear Salespersons
5213	Informal Waiters/Waitresses
4645	Information Clerks
3971	Information System Programmers
7342	Injection Molding Machine Operators
7542	Injection Molding Machine Tenders
7342	Injection Molding Machine Tenders
5515	Inside Horticulture-Specialty Growers
6853	Inside Upholsterers
1473	INSPECTORS AND COMPLIANCE OFFICERS
1210	Institution Directors
12103	INSTITUTION DIRECTORS
2510	Institutional Librarians
2360	INSTRUCTIONAL COORDINATORS
2360	Instructional Material Directors
6813	Instrument Makers
6151	Instrument Repairers
32301	INSTRUMENTAL MUSICIANS
3230	Instrumental Musicians
3711	Instrumentation Technicians
3710	Instruments Surveyor Assistants
6465	INSULATION WORKERS
6465	Insulation-Power-and-Unit Tenders
4782	INSURANCE ADJUSTER, EXAMINERS, AND INVESTIGATORS
2110	Insurance Attorneys
4122	INSURANCE SALES AGENTS
3720	Integrated Circuit Layout Designers
1919	Intelligence Research Specialists
32203	INTERIOR DESIGNERS
3220	Interior Designers
1412	Internal Auditors
2610	Internists
26103	INTERNISTS
3290	INTERPRETERS
3290	Interpreters of the Deaf
4642	INTERVIEWING CLERKS
4754	Inventory Clerks
7314	Ironworker Machine Operators
1628	Irrigation Engineers
6479	Irrigation System Installers
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5133	Jailers
5244	JANITORS AND CLEANERS
6822	JEWELERS
4340	Jewelry Salespersons
7633	Jigsaw Operators
1430	Job Analysts
1430	Job Development Specialists
34012	Jockeys
3401	Jockeys
6466	Joint-Cleaning-and-Grooving-Machine Operators
2120	JUDGES
	-K-
4793	Keypunch Operators
8618	Kiln-Burner Helpers
8618	Kiln-Operator Helpers
5219	Kitchen Food Assemblers
5219	KITCHEN HELPERS
4450	Knitting Demonstrators

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1430	Labor Relations Managers
3890	Laboratory Assistants
1845	Laboratory Supervisors
3831	Laboratory Testers
8769	Laborers
1353	Land Development Managers
1353	Land Leases-and-Rentals Managers
1643	Land Surveying Managers
1643	LAND SURVEYORS
16101	LANDSCAPE ARCHITECTS
1610	Landscape Architects
1330	Landscape Contractors
3720	Landscape Drafters
5515	Landscape Gardeners
5622	Landscape Laborers
3890	Laser Technicians
7512	LATHE AND TURNING MACHINE OPERATORS
7512	Lathe Hand
6424	Lathers
7658	LAUNDERING AND DRY CLEANING MACHINE OPERATORS
8769	Laundry Laborers
4363	Laundry Pricing Clerks
1359	Laundry Superintendents
7658	Laundry Workers II
1101	Law Enforcement Directors
6479	Lawn Sprinkler Installers
5622	Lawn-Service Workers
2110	LAWYERS
6422	Lay-Out Workers
1353	Leasing Managers
7658	Leather Cleaners
4240	Leather Goods Sales Representatives
6854	LEATHER WORKERS AND REPAIRERS
3960	Legal Investigators
4622	Legal Secretaries
3960	LEGAL TECHNICIANS
1101	Legislative Assistants
2510	LIBRARIANS
4694	Library Assistants
4694	LIBRARY CLERKS
3660	LICENSED PRACTICAL NURSES
1101	Licensing and Registration Directors
8214	Light Truck Drivers
8214	LIGHT TRUCK DRIVERS
6433	Line Erectors
6433	Line Maintainers
6433	Line Repairers
8726	Line-Service Attendants
7642	Linotype Operators
8214	Liquid-Fertilizer Servicers
1351	Liquor Establishment Managers
6842	LITHOGRAPHERS AND PHOTOENGRAVERS
7444	Lithographic Photographer
6842	Lithographic Plate Maker
1443	Livestock Commission Agents
4240	Livestock Commission Agents
5514	LIVESTOCK FARMERS
5617	Livestock Farmworkers
4240	Livestock Sales Representatives
5617	LIVESTOCK WORKERS
5617	Livestock-Yard Attendants
6932	Load Dispatchers
8726	Loader Helpers
1415	Loan Counselors
1415	LOAN OFFICER
3320	Lobbyists
8761	Locker-Plant Attendants
6173	LOCKSMITHS
8232	Locomotive Engineers
8232	Locomotive Firers
8233	Locomotive Operator Helpers
8232	LOCOMOTIVE OPERATORS
1351	Lodging Facilities Managers
8730	Lubrication Servicers
6854	Luggage Repairers
4752	Lumber Estimators
8726	Lumber Handlers
8726	Lumber Straighteners
8218	Lunch-Truck Drivers
5216	Lunchroom or Coffee Shop Counter Attendants
3210	Lyricists

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6178	Machine Assemblers
8725	MACHINE FEEDERS AND OFFBEARERS
7542	Machine Molders
8618	MACHINE OPERATOR HELPERS
7662	Machine Packagers
7657	Machine Pressers
7669	Machine Sprayers
7658	Machine Washers
6178	Machinery Erectors
6813	MACHINISTS
2120	Magistrates
4793	Magnetic-Tape-Typewriter Operators
4743	MAIL CARRIERS
4744	MAIL CLERKS
4742	Mail Handlers
6174	Mail-Processing-Equipment Mechanics
6422	Maintenance Carpenters
6153	Maintenance Electricians
6813	Maintenance Machinists
6178	Maintenance Mechanics
4751	Maintenance Service Dispatchers
1342	Maintenance Superintendents
1320	Maintenance Superintendents
1330	Maintenance-of-Way Superintendents
5253	Make-Up Artists
4240	Malt Liquors Sales Representatives
1420	MANAGEMENT ANALYSTS
3312	Managing Newspaper Editors
5253	Manicurists
8769	MANUAL WORKERS
3033	Manual-Arts Therapists
6178	Manufacturer's Service Representatives
4240	Manufacturers' Representatives
1636	Manufacturing Applications Engineers
1634	Manufacturing Engineers
8769	Markers II
19121	MARKET-RESEARCH ANALYSTS I
19121	Market-Research Analysts I
1250	MARKETING AND ADVERTISING MANAGERS
4752	Material Coordinators
8726	Material Handlers
4752	Material Listers
1634	Material Schedulers
4754	Materials Clerks
1733	Mathematical Statisticians
1739	MATHEMATICIANS

7753	Meat Boners
6871	Meat Butchers
5219	Meat Cutters
7753	Meat Trimmers
7720	Mechanical Assemblers
3720	Mechanical Drafters
3713	MECHANICAL ENGINEERING TECHNICIANS
1635	MECHANICAL ENGINEERS
4210	Mechanical Equipment Sales Engineers
1635	Mechanical Equipment Test Engineers
1635	Mechanical Research Engineers
6117	Mechanical-Unit Repairers
3250	Medical and Scientific Illustrators
32501	Medical and Scientific Illustrators
52333	MEDICAL ASSISTANTS
5233	Medical Assistants
3690	Medical Laboratory Assistants
36903	MEDICAL LABORATORY TECHNICIANS
3690	Medical Laboratory Technicians
1843	Medical Physicists
1310	Medical Record Administrators
1855	MEDICAL SCIENTISTS
4622	Medical Secretaries
2032	Medical Social Workers
3620	Medical Technologists
4794	Medical-Record Clerks
5233	Medication Aides
1310	MEDICINE AND HEALTH MANAGERS
4622	Membership Secretaries
4240	Men's and Boy's Apparel Sales Representatives
4340	Men's and Boys' Clothing Salespersons
5233	Mental-Retardation Aides
32207	MERCHANDISE DISPLAYERS
3220	Merchandise Displayers
1370	Merit System Directors
6473	Metal Building Assemblers
7339	Metal Fabricators
6172	Metal-Reed Tuners
1623	Metallographers
1623	METALLURGICAL AND MATERIALS ENGINEERS
3710	Metallurgical Technicians
1846	METEOROLOGISTS
4755	METER READERS
3711	Meters Superintendents
18544	MICROBIOLOGISTS
1854	Microbiologists
3620	Microbiology Technologists
3711	Microelectronics Technicians
8213	Milk Route Drivers
7513	MILLING AND PLANING MACHINE OPERATORS
1320	Milling General Superintendents
6178	Millwrights
6178	MILLWRIGHTS
1847	Mineralogists
1624	Mines Safety Engineers
1624	MINING ENGINEERS
1624	Mining-and-Oil Well Equipment Research Engineers
1624	Mining-and-Oilfield Equipment Design Engineers
1624	Mining-and-Oilfield Equipment Test Engineers
6464	Mirror Installers
8618	Mix-Machine Feeders
8618	Mixer Helpers
7664	Mixers Operators
7664	MIXING AND BLENDING MACHINE OPERATORS
3250	Modeler
4450	Models
7542	Mold Makers
7542	MOLDING AND CASTING MACHINE OPERATORS
7342	MOLDING AND CASTING MACHINE SETUP OPERATORS
6444	Molding Plasters
5233	Morgue Attendants
4696	Morgue Librarians
4712	Mortgage-Accounting Clerks
4712	Mortgage-Loan-Computation Clerks
5253	Mortuary Beauticians
5246	Mosquito Sprayers
3250	Motion Picture Cartoonists
3240	Motion Picture Directors
3260	Motion Picture Photographers
8232	Motor Operators
4751	Motor Vehicle Dispatchers
1473	Motor Vehicle Inspectors
4240	Motor Vehicles and Supplies Sales Representatives
6932	Motor-Room Controllers
6114	Motorboat Mechanics
3401	Motorcycle Racers
34012	Motorcycle Racers
6114	Motorcycle Repairers
7830	Motorcycle Testers
1625	Mud-Analysis Well Logging Captains
1625	Mud-Analysis Well Logging District Supervisors
6111	Muffler Installers
6479	Municipal Maintenance Workers
2520	Museum Attendants
2520	Museum or Zoo Directors
2520	Museum Technicians
3230	Music Directors
2360	Music Supervisors
6172	MUSICAL INSTRUMENT REPAIRERS AND TUNERS
4340	Musical Instruments and Accessories Salespersons
3230	MUSICIANS AND COMPOSERS

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8250	Navigators
2610	Neurologists
4642	New-Accounts Clerks
3240	News Directors
3312	News Editors
4365	NEWS VENDORS
3313	Newscasters
4365	Newspaper Carriers
3312	Newspaper Editors
8218	Newspaper-Delivery Drivers
3313	Newswriters
4712	Night Auditors
4791	Note Tellers
4240	Novelties Sales Representatives
1627	NUCLEAR ENGINEERS
1627	Nuclear Equipment Design Engineers
1627	Nuclear Equipment Research Engineers
1627	Nuclear Equipment Test Engineers
3650	Nuclear Medical Technologists
7512	Numerical Control Lathe Operators
5236	Nurse Aides
29012	NURSE ANESTHETISTS
2901	Nurse Anesthetists

29011	NURSE PRACTITIONERS
2901	Nurse Practitioners
2901	Nurse-Midwives
5264	Nursery School Attendants
5236	NURSING AIDES, ORDERLIES, AND ATTENDANTS
1310	Nursing Service Directors
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2610	Obstetricians
1310	Occupational Health Nursing Directors
2901	Occupational Health Nursing Staff Nurses
3032	OCCUPATIONAL THERAPISTS
5233	Occupational Therapy Aides
5233	Occupational Therapy Assistants
52332	OCCUPATIONAL THERAPY ASSISTANTS
1473	Occupational-Safety-and-Health Inspectors
1847	Oceanographer
4630	Office Clerks
6174	OFFICE MACHINE REPAIRERS
6174	Office-Machine Servicers
4240	Office Machines Sales Representatives
1101	Office Managers
1370	Office Managers
2901	Office Nurses
7643	Offset Duplicating Machine Operators
4722	Offset-Duplicating Machine Operators
7443	Offset Press Operators I
7643	Offset Press Operators II
6520	OIL WELL DRILLERS
1625	Oil-Well Services Superintendents
8312	Operating Engineers
8312	OPERATING ENGINEERS
1341	Operations Directors
1342	Operations General Agents
1341	Operations Managers
26104	OPHTHALMOLOGISTS
2610	Ophthamologists
6864	OPTICAL GOODS WORKERS
6864	Opticians
3713	Optomechanical Technicians
3690	Optometric Assistants
36905	OPTOMETRIC ASSISTANTS
2810	OPTOMETRISTS
2620	Oral Surgeons
3230	Orchestra Conductors
5236	Orderlies
7339	Ornamental Metal Workers
6865	Orthodontic Technicians
2620	Orthodontists
3690	Orthopedic Assistant
3690	Orthotists
2610	Osteopathic Physicians
26108	OSTEOPATHS
4153	Outdoors Advertising Leasing Agents
1310	Outpatient Services Directors
4642	Outpatient-Admitting Clerks
1449	Outside Property Agents
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7662	PACKAGING AND FILLING MACHINE OPERATORS
8761	Packing-Line Workers
4694	Pages
6115	Paint Sprayer Sandblasters
6442	PAINTERS
3250	Painters (Fine Arts)
32502	PAINTERS (FINE ARTS)
3250	PAINTERS, SCULPTORS, CRAFT-ARTISTS, AND ARTISTS-PRINTMAKERS
4450	Painting Instructors
7669	PAINTING MACHINE OPERATORS
1847	Paleontologists
4240	Paper and Paper Products Sales Representatives
6443	PAPERHANGERS
3960	Paralegal Assistants
1855	Parasitologists
4744	Parcel-Post Clerks
4364	Parimutuel-Ticket Cashiers
4712	Parimutuel-Ticket Checkers
4364	Parimutuel-Ticket Sellers
4645	Park Aides
1852	Park Naturalists
1101	Park Rangers
1101	Park Superintendents
5134	Parking Enforcement Officers
5622	Parks and Grounds Groundskeepers
2032	Parole Officers
4754	Parts Clerks
4030	Parts Managers
6813	Parts Salvagers
4366	Party Plan Salesperson-Demonstrators
8113	Passenger Car Conductors
5257	Passenger Service Representatives
8233	Passenger Train Brakers
5219	Pastry Cook Helpers
5214	Pastry Cooks
3960	Patent Agents
2610	Pathologists
26101	PATHOLOGISTS
6466	PAVING EQUIPMENT OPERATORS
4440	Pawnbrokers
4366	Peddlers
2610	Pediatricians
26105	PEDIATRICIANS
2620	Pedodontists
6172	Percussion-Instrument Repairers
3831	Perfumers
3690	Perfusionists
2620	Periodonists
1230	PERSONNEL MANAGERS
1430	Personnel Recruiters
4752	Personnel Schedulers
1430	PERSONNEL SPECIALISTS
4152	Pest Control Service Sales Agents
5246	PEST CONTROL SERVICES
1625	PETROLEUM ENGINEERS
1847	Petroleum Geologists
4340	Pets and Pet Supplies Salespersons
4230	Pharmaceutical Detailers
3690	Pharmacist Assistants
3010	PHARMACISTS
1855	Pharmacologists
5233	Pharmacy Helpers
52334	PHARMACY HELPERS
1919	Philologists
5233	Phlebotomists
4340	Phonograph Records and Tape Recordings Salespersons
7642	Photocomposing Machine Operators
4722	Photocopying-Machine Operators
6842	Photoengravers

7444	PHOTOENGRAVING AND LITHOGRAPHING MACHINE SETUP OPERATORS
7444	Photoengraving Photographer
6842	Photoengraving Printers
4753	Photofinishing Laboratory Workers
3710	Photogrammetrists
6868	Photograph Retouchers
3260	PHOTOGRAPHERS
4450	Photographers' Models
6171	Photographic Equipment Technicians
6868	Photographic Process Screen Makers
6868	PHOTOGRAPHIC PROCESS WORKERS
4722	Photographic-Machine Operators
6868	Photography Colorists
3260	Photojournalists
7642	Photolettering Machine Operators
7642	Phototypesetting Operators
19191	Physical Anthropologists
1623	Physical Metallurgists
5233	Physical Therapist Assistants
52331	PHYSICAL THERAPIST ASSISTANTS
3033	PHYSICAL THERAPISTS
5233	Physical Therapy Aides
3040	PHYSICIAN ASSISTANTS
2610	PHYSICIANS
1843	PHYSICISTS
1854	Physiologists
6172	Piano Technicians
6172	Piano Tuners
6450	Pipe Fillers
6172	Pipe-Organ Tuners and Repairers
3401	Pit Stewards
5214	Pizza Bakers
7513	Planing Machine Operators
1853	Plant Breeders
1635	Plant Engineers
18545	PLANT PATHOLOGISTS
1854	Plant Pathologists
1359	Plant Protection Superintendents
6444	PLASTERERS
6811	Plastic Tool Makers
7443	Platen Press Operators
7643	Platen-Press Feeders
7343	Platers
7343	PLATING MACHINE SETUP OPERATORS
5264	Playroom Attendants
3210	Playwrights
6450	PLUMBERS AND PIPE FITTERS
1472	Plumbing Inspectors
5233	Podiatric Assistants
2830	PODIATRISTS
3210	Poets
4630	Police Aides
5132	POLICE AND DETECTIVES
1101	Police Chiefs
4630	Police Clerks
1101	Police Commissioners I
4732	Police District Switchboard Operators
5132	Police Officers I
5133	Police Officers II
1919	Political Scientists
3690	Pollution-Control Technicians
1352	Pool Managers
4742	Post-Office Clerks
4742	POSTAL CLERKS
1344	Postal Service Sectional Center Managers
4712	Posting Clerks
1344	POSTMASTERS
5514	Poultry Farmers
1853	Poultry Scientists
2701	Poultry Veterinarians
5617	Poultry-Farmworkers
6479	Poured-Concrete-Wall Technicians
6932	POWER PLANT AND SYSTEMS OPERATORS
7517	Power Press Tenders
6932	Power Reactor Operators
1633	Power System Electrical Engineers
1633	Power-Distribution Engineers
6153	Powerhouse Electricians
8769	Powerhouse Laborers
3650	Practical Nurses
6867	Precision Assemblers
6867	PRECISION EQUIPMENT ASSEMBLERS
6171	PRECISION INSTRUMENT REPAIRERS
4240	Precision Instruments Sales Representatives
2310	PREKINDERGARTEN AND KINDERGARTEN TEACHERS
2310	Preschool Teachers
1210	Presidents
7517	PRESS AND BRAKE MACHINE OPERATORS
7657	PRESSING MACHINE OPERATORS
8769	Prestressed Concrete Laborers
1282	Principals
4623	Print Shop Stenographers
7443	Printers II
4752	Printing Estimators
7643	PRINTING MACHINE OPERATORS
7443	PRINTING PRESS SETUP OPERATORS
4240	Printing Supplies Sales Representatives
3250	Printmakers
2901	Private Duty Nurses
5144	Private Investigators
2110	Probate Lawyers
20322	PROBATION OFFICERS
2032	Probation Officers
8618	Processor Helpers
1449	Procurement Engineers
32403	PRODUCERS
3240	Producers
1634	Product-Safety Engineers
4752	PRODUCTION AND PLANNING CLERKS
7720	Production Assemblers
7518	Production Boring Machine Operators
4752	Production Clerks
4752	Production Coordinators
7518	Production Drill Press Operators
1634	Production Engineers
7820	PRODUCTION INSPECTORS
7312	Production Lathe Operators
7714	Production Line Welders
3240	Production Managers
7513	Production Milling Machine Operators
1634	Production Planners
4792	Production Proofreaders
7840	PRODUCTION SAMPLERS AND WEIGHERS
1320	Production Superintendents
7830	PRODUCTION TESTERS
7840	Production Weighers
1635	Products Mechanical-Design Engineers
3401	Professional Athletes

34012	PROFESSIONAL ATHLETES
3401	Professional Sports Scouts
32404	PROGRAM DIRECTORS
3240	Program Directors
1370	Program Managers
4752	Progress Clerks
5244	Project-Crew Workers
6868	Projection Printers
4792	PROOFREADERS
1353	PROPERTY MANAGERS
1353	Property Managers
1370	Property-Disposal Officers
1370	Property-Utilization Officers
3210	Prose, Fiction, and Nonfiction Writers
3690	Prosthetists
2620	Prosthodontists
5236	Psychiatric Aides
5214	Psychiatric Hospital Cooks
2032	Psychiatric Social Workers
3660	Psychiatric Technicians
2610	Psychiatrists
26107	PSYCHIATRISTS
1915	PSYCHOLOGISTS
6151	Public Address Servicers
1101	PUBLIC ADMINISTRATORS
1353	Public Events Facilities Rental Managers
2360	Public Health Educators
1101	Public Health Service Officers
2620	Public-Health Dentists
1855	Public-Health Microbiologists
2032	Public Housing Comm.-Relations-&-Services Advisors
3320	PUBLIC RELATIONS SPECIALISTS
3320	Public-Relations Representatives
1101	Public Works Commissioners
3312	Publications Editors
8113	Pullman Conductors
3690	Pulmonary-Function Technicians
8618	Pumper Helpers
7314	Punch Press Operators I
7514	Punch Press Operators II
7314	Punch Press Setters
7514	PUNCHING AND SHEARING MACHINE OPERATORS
7314	PUNCHING AND SHEARING MACHINE SETUP OPERATORS
1449	Purchase-Price Analysts
1449	PURCHASING AGENTS
1449	Purchasing Agents

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1634	Quality Control Engineers
4754	Quality-Control Clerks
1634	Quality-Control Engineers
3890	Quality-Control Technicians
3250	Quick Sketch Artists

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3401	Racehorse Trainers
3401	Racetrack Stewards
3401	Racing Secretaries and Handicappers
3650	Radiation-Therapy Technologists
3330	RADIO AND TELEVISION ANNOUNCERS
4153	Radio and Television Time Sales Representatives
3240	Radio Directors
4751	Radio Dispatchers
3930	RADIO OPERATORS
6155	Radio Repairers
3650	RADIOLOGIC TECHNOLGISTS
2610	Radiologists
1310	Radiology Administrators
3010	Radiopharmacists
3930	Radiotelegraph Operators
3930	Radiotelephone Operators
8232	Rail-Tractor Operators
8233	RAILROAD BRAKE, SIGNAL, AND SWITCH OPERATORS
8113	RAILROAD CONDUCTORS AND YARDMASTERS
1628	Railroad Engineers
1330	Railroad-Construction Directors
1862	Range Managers
3210	Readers
4123	Real Estate Appraisers
2110	Real Estate Lawyers
4123	REAL ESTATE SALES AGENTS
1353	Real-Estate Agents
4630	Real-Estate Clerks
4645	RECEPTIONISTS
3710	Recording Engineers
4696	Records Custodians
1420	Records-Management Analysts
1352	RECREATION AND ENTERTAINMENT MANAGERS
2033	Recreation Center Directors
1352	Recreation Establishment Managers
1352	Recreation Facility Managers
2033	Recreation Leaders
1101	Recreation Superintendents
1352	Recreation Supervisors
2033	RECREATION WORKERS
1430	Recruiters
6931	Refrigerating Engineers
6160	Refrigeration Mechanics
6160	Refrigeration Mechanics
6160	Refrigeration Unit Repairers
6171	Register Repairers
2901	REGISTERED NURSES
4744	Registered-Mail Clerks
4645	Registrars
4694	Registration Clerks
4642	Registration Clerks
6473	Reinforcing-Metal Workers
3313	REPORTERS
6868	Reproduction Technicians
2520	Research Assistants
2520	Research Associates
1625	Research Chief Engineers
3020	Research Dietitians
4644	RESERVATION AGENTS
1220	Reserve Officers
2401	Residence Counselors
24012	RESIDENCE COUNSELORS
4123	Residence Leasing Agents
5264	Residence Supervisors
3031	RESPIRATORY THERAPISTS
5233	Respiratory-Therapy Aides
4030	RETAIL SALES SUPERVISORS
4340	RETAIL SALESPERSON
4030	Retail Store Managers
1370	Retirement Officers
1101	Revenue Directors
8233	Road Freight Brake Couplers
8113	Road Freight Conductors

6468	Road-Oiling-Truck Drivers
6466	Road-Roller Operators
1101	Roads Supervisors
6422	Roof Assemblers I
6468	Roofer Applicators
6468	ROOFERS
6520	Rotary Derrick Operators
6520	Rotary Drillers
8650	Rotary-Driller Helpers
6422	Rough Carpenters
4753	Route-Delivery Clerks
4743	Rural-Mail Carriers
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6854	Saddle Makers
6173	Safe-and-Vault Service Mechanics
4240	Safety Apparel and Equipment Sales Representatives
1101	Safety Council Directors
1473	Safety Inspector
5219	Salad Makers
4362	Sales Attendants
4362	SALES CLERKS
4210	SALES ENGINEERS
4450	Sales Exhibitors
1250	Sales Managers
4240	SALES REPRESENTATIVES
8218	Sales Route Driver Helpers
8218	Sales Route Drivers
4123	Sales Superintendents
4153	Sales-Promotion Representatives
3320	Sales-Service Promoters
8769	Salvage Laborers
7840	Samplers
5219	Sandwich Makers
3690	Sanitarians
36904	SANITARIANS
1628	Sanitary Engineers
1473	Sanitation Inspectors
1101	Sanitation Superintendents
6151	Satellite Communications Antenna Installers
7633	SAWING MACHINE OPERATORS
5214	School Cafeteria Cooks
5264	School Child-Care Attendants
4240	School Equipment and Supplies Sales Representatives
2510	School Library Media Specialists
2901	School Nurses
1310	School of Nursing Directors
1915	School Psychologists
4622	School Secretaries
2032	School Social Workers
1210	School Superintendents
1610	School-Plant Consultants
3890	SCIENCE TECHNOLOGISTS AND TECHNICIANS
1919	Scientific Linguists
3260	Scientific Photographers
3401	Scorers
3210	Screen Writers
3250	Sculptor
7657	Seam Pressers
2330	SECONDARY SCHOOL TEACHERS
4622	SECRETARIES
4124	SECURITIES AND FINANCIAL SERVICES SALES AGENTS
4712	Securities Clerks
4124	Securities Sales Agents
4124	Securities Traders I
5144	Security Consultants
5144	Security Guards
3820	Seed Analysts
1625	Seismic Prospecting Observers
1847	Seismologists
4362	Self-Service Store Stock Clerks
4363	Self-Service-Laundry-and-Dry-Cleaning Attendants
3711	Semiconductor-Development Technicians
4751	Service Clerks
6114	Service Engine Repairers
4751	Service or Work Dispatchers
1369	SERVICE ORGANIZATIONS MANAGERS
3250	Set Illustrators
32501	Set Illustrators
6479	Sewer Line Repairers
6479	Sewer-Pipe Cleaners
7655	SEWING MACHINE OPERATORS
7655	Sewing Machine Operators
4450	Sewing Techniques Demonstrators
5244	Sextons
7314	Shear Operator I
7514	Shear Operators II
7314	Shear Setters
6824	SHEET METAL WORKERS
6424	Sheetrock Applicators
5134	SHERIFFS, BAILIFFS, AND LAW ENFORCEMENT OFFICERS
6854	Shoe Repairers
4340	Shoes Salespersons
6115	Shop Estimators
5215	SHORT-ORDER COOKS
5215	Short-Order Cooks I
5215	Short-Order Cooks II
4623	Shorthand Reporters
6479	Siders
4153	Signs and Displays Sales Representatives
4153	Signs Sales Representatives
6822	Silversmiths
18521	Silviculturists
1852	Silviculturists
3230	Singers
32302	SINGERS
1352	Skating Rink Managers
7753	Skinners
6114	SMALL ENGINE REPAIRERS
7720	Small Parts Assemblers
7720	Small Products Assemblers
6114	Small-Engine Mechanics
1915	Social Psychologists
1919	SOCIAL SCIENTISTS
4622	Social Secretaries
1916	Social Welfare Research Workers
2032	SOCIAL WORKERS
2032	Social-Services Aides
1916	SOCIOLOGISTS
6462	Soft-Tile Setters
3971	Software Technicians
1852	Soil Conservation Technicians
18522	SOIL CONSERVATIONISTS
1852	Soil Conservationists
18532	SOIL SCIENTISTS
1853	Soil Scientists

1847	Soils Engineers
1635	Solar-Energy-Systems Designers
3710	Sound Mixers
6151	Sound Technicians
5132	Special Agents
2510	Special Collections Librarians
2350	SPECIAL EDUCATION TEACHERS
2350	Special Education Work-Study Coordinators
2510	Special Library Librarians
2401	Special Services Supervisors
5214	Specialty Cooks
3710	Specification Writers
3034	Speech Pathologists
3034	SPEECH PATHOLOGISTS AND AUDIOLOGISTS
4340	Sporting Goods Salespersons
3240	Sports Directors
6118	Sprinkler-Irrigation-Equipment Mechanics
5624	Stable Attendants
1854	Staff Toxicologists
3240	Stage Directors
6811	Stamping Die Makers
5132	State-Highway Police Officers
1919	State-Historical Society Directors
4642	Statement-Request Clerks
3920	Station Air-Traffic-Control Specialists
6158	Station Installer-and-Repairers
1341	Station Managers
6931	STATIONARY ENGINEERS
4794	STATISTICAL CLERKS
1733	STATISTICIANS
4623	STENOGRAPHERS
4623	Stenotype Operators
4230	Stereo Equipment Salespersons
3260	Still Photographers
4754	STOCK AND INVENTORY CLERKS
4754	Stock Clerks
7633	Stock Graders
8724	STOCK HANDLERS AND BAGGERS
4754	Stock-Control Clerks
6822	Stone Setters
6466	Stone-Spreader Operators
8769	Stores Laborers
87692	STORES LABORERS
8318	Straddle-Truck Operators
8232	Streetcar Operators
1622	Stress Analysts
6842	Strippers
3720	Structural Drafters
1628	Structural Engineers
6473	STRUCTURAL METAL WORKERS
6473	Structural-Steel Workers
6444	Stucco Masons
7662	Stuffing Machine Operators
6422	Subassembly Assemblers
6153	Substation Electricians
6932	Substation Operators
12101	SUPERINTENDENT OF SCHOOLS
1320	Superintendents
1341	Supervisor of Communications
26106	SURGEONS I
2610	Surgeons I
4230	Surgical Appliances Salespersons
3690	Surgical Technicians
36907	SURGICAL TECHNICIANS
4642	Survey Workers
8646	SURVEYOR HELPERS
6479	Swimming Pool Installers and Servicers
8233	Switch Tenders
	-T-
6852	TAILORS AND DRESSMAKERS
5216	Take Out Waiters/Waitresses
4694	Talking Books Library Clerks
6466	Tamping-Machine Operators
8213	Tank Truck Drivers
6155	Tape-Recorder Repairers
6424	Tapers
1412	Tax Accountants
2110	Tax Attorneys
1412	Tax Auditors
4712	Tax Preparers
8216	Taxi Drivers
4752	Taxicab Coordinators
8216	TAXICAB DRIVERS AND CHAUFFEURS
4795	TEACHER AIDES
4795	Teacher Aides I
4795	Teacher Aides II
2350	Teacher of Mentally Retarded
2350	Teachers of Blind
2350	Teachers of Deaf
2350	Teachers of Handicapped Students
3020	Teaching Dietitians
3620	Teaching Supervisor Medical Technologists
1341	Technical Directors
3720	Technical Illustrators
4230	TECHNICAL SALES WORKERS AND SERVICE ADVISORS
3711	Technical Testing Engineer
2390	Technical Training Coordinators
2390	Technical Training Instructors
3980	TECHNICAL WRITERS
4751	Telecommunications
1341	Telegraph Office Managers
6158	TELEPHONE INSTALLERS AND REPAIRERS
6158	Telephone Maintenance Mechanics
4732	TELEPHONE OPERATORS
4152	Telephone Services Sales Representatives
4366	Telephone Solicitors
32402	TELEVISION DIRECTORS
3240	Television Directors
6155	Television-and-Radio Repairers
6151	Television-Cable Installers
4364	Tellers
4793	Terminal Operators
4793	Terminal-System Operators
5246	Termite Exterminator Helpers
5246	Termite Exterminators
6872	Test Bakers
8250	Test Pilots
3710	Test Technicians
3710	Testers
1472	Testers
1352	Theatre Managers
1843	Theoretical Physicists
7512	Threading Machine Operators
4644	Ticket Agents
4364	Ticket Sellers
4644	Ticketing Clerks
1634	Time-Study Engineers
3620	Tissue Technologists
3960	Title Clerks

3960	Title Examiners
3960	Title Searchers
6811	TOOL AND DIE MAKERS
1636	Tool Designers
6811	Tool Makers
4363	Tool-and-Equipment Rental Clerks
3710	Topographical Drafters
8213	Tow Truck Operators
3920	Tower Air-Traffic-Control Specialists
3820	Toxicologists
8232	Trackmobile Operators
6112	Tractor Mechanics
8318	Tractor Operators
8212	TRACTOR-TRAILER TRUCK DRIVERS
8212	Tractor-Trailer Truck Drivers
4753	Traffic Clerks
1341	Traffic Managers
1342	Traffic Managers
4753	TRAFFIC, SHIPPING, AND RECEIVING CLERKS
1101	Traffic-Safety, Administrators
4340	Trailers and Mobile Homes Salespersons
8113	Train Dispatchers
2390	Training Representatives
4623	Transcribing-Machine Operators
8725	Transfer Operators
6152	Transformer Repairers
3290	Translators
6111	Transmission Mechanics
1633	Transmitter Engineers-in-Charge
3930	Transmitter Operators
5257	TRANSPORTATION ATTENDANTS
1210	Transportation Directors
1628	Transportation Engineers
7669	Transportation Equipment Painters
1342	TRANSPORTATION FACILITIES MANAGERS
1359	Travel Agency Managers
4369	TRAVEL AGENTS
4644	Travel Clerks
1220	Treasurers
3820	Tree Surgeons
7633	Trimmer Sawyers
6422	Trimmers
6153	Trouble Shooters I
6433	Trouble Shooters II
1342	Truck Terminal Managers
6115	Truck-Body Builders
8726	Truck-Driver Helpers
6111	Tune-Up Mechanics
6932	Turbine Operators
2390	Tutors
7642	TYPESETTING AND COMPOSING MACHINE OPERATORS
6174	Typewriter Repairers
4624	TYPISTS

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3620	Ultrasound Technologists
3401	Umpires
1414	UNDERWRITERS
1414	Underwriters
8725	Unscramblers
6853	UPHOLSTERERS
7655	Upholstery Sewers
1920	URBAN AND REGIONAL PLANNER
2610	Urologists

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6156	Vacuum Cleaner Repairers
8212	Van Drivers
8726	Van-Driver Helpers
4793	Varitype Operators
1250	Vehicle Leasing and Rental Managers
4030	Vending-Stand Supervisors
4366	Vendors
2120	Veteran Appeals Reviewers
4230	Veterinarian Supplies Sales Representatives
2701	VETERINARIANS
2701	Veterinary Anatomists
2701	Veterinary Bacteriologists
2701	Veterinary Epidemiologists
3690	Veterinary Laboratory Technicians
2701	Veterinary Livestock Inspectors
2701	Veterinary Meat Inspectors
2701	Veterinary Pharmacologists
2701	Veterinary Virologists
1210	Vice Presidents
3930	Video Operators
6172	Violin Repairers
2401	VOCATIONAL AND EDUCATIONAL COUNSELORS
2390	Vocational Training Instructors
23904	VOCATIONAL TRAINING INSTRUCTORS
2350	Vocational Training Teachers
2401	Vocational-Rehabilitation Counselors
24013	VOCATIONAL-REHABILITATION COUNSELORS
1359	Volunteer Services Coordinators
2032	Volunteer Services Supervisors

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5213	WAITERS AND WAITRESSES
4630	Ward Clerks
1342	Warehouse Managers
8725	Washing-Machine Loaders-and-Pullers
6910	Waste-Treatment Operators
3831	Wastewater Treatment Plant Chemists
6910	Wastewater-Treatment-Plant Attendants
6910	Wastewater-Treatment-Plant Operators
6171	Watch Repairers
6910	WATER AND SEWAGE TREATMENT PLANT OPERATORS
3831	Water Purification Chemists
6450	Water-Meter Installers
1473	Water-Pollution Control Inspectors
6450	Water-Softener Servicer-and-installers
6910	Waterworks Pump-Station Operators
7669	Waxing Machine Operators
3690	Weather Observers
7443	Web Press Operators
7840	Weighers
1739	Weight Analysts
7830	Weld Inspectors II
7714	Welder-Fitters
7714	WELDERS
1623	Welding Engineers
4230	Welding Equipment Sales Representatives
1101	Welfare Directors
6474	Well-Drill Operators
1442	WHOLESALE AND RETAIL BUYERS
5253	Wig Dressers
6172	Wind-Instrument Repairers
5244	Window Cleaners
1352	Winter Sport Managers

6867	Wire Coilers
6154	Wirers
4240	Women's and Girl's Apparel Sales Representatives
4340	Women's Apparel and Accessories Salespersons
6832	Wood Machinists
1852	Wood Technologists
18521	Wood Technologists
8769	Woodworking-Shop Hands
4624	Word-Processing-Machine Operators
46242	WORD-PROCESSING-MACHINE OPERATORS
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8113	Yard Conductors
8233	Yard Couplers
8232	Yard Engineers
4340	Yard Goods Salespersons
8113	Yard Managers
5622	Yard Workers
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2701	Zoo Veterinarians
1854	Zoologists

The **Nebraska Career Information System** (NCIS) enhances the efforts of agencies and schools involved in occupational counseling and education by:

- Collecting current labor market and educational information and developing it into usable forms.
- Developing and managing delivery systems.
- Consulting with user agencies on use of career information in counseling and instructional programs.

Nebraska Career Information System
421 Nebraska Hall
University of Nebraska-Lincoln
Lincoln, NE 68588-0552
(402)472-2570